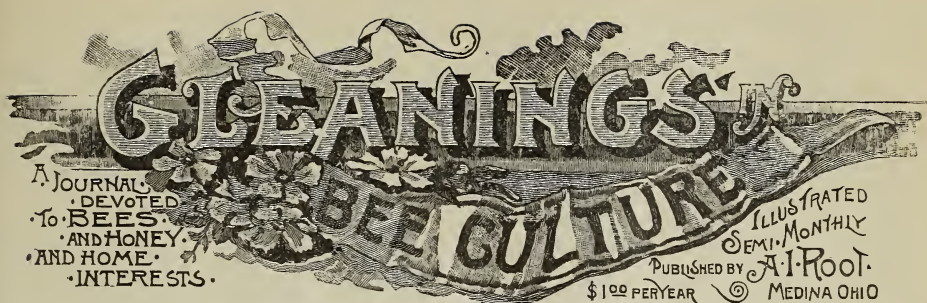


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Vol. XXI.

OCT. 1, 1893.

No. 19.

STRAY STRAWS

FROM DR. C. C. MILLER.

LOUISIANA HOTEL, Chicago, Oct. 11, 12, 13.

SEPTEMBER 18 broke the long drouth at Marengo.

PRICES OF HONEY haven't come down yet, and I don't believe they're going to come down much.

NOW RAMBLER's mind will all be torn to pieces till he finds out whether "Anonymous," on p. 710, is a widow or—or—what.

MORE BEE-KEEPERS will probably meet in Chicago Oct. 11 than have ever met at one time and place before—on this side of the big pond.

A GRAND HONEY-FLOW and a big crop don't always go together. In some places there was a fine flow but not bees enough to take care of it.

"WE HAVE NEVER seen so fine and so complete a work on apiculture as Root's A B C," says the editor of *Le Rucher*. There's a Frenchman of good judgment.

QUITE A PICTURE GALLERY is given in the last *Nebraska Bee-keeper*, which, with sketches of the western bee-keepers shown, makes an interesting number.

W. C. FRAZIER make some good points on page 701. Now, how shall we focus on these points the gaze of those to whom we must look for proper appropriations?

THE CALIFORNIA OUTPUT of honey, at least in the southern part of the State, according to C. N. Wilson, in *Rural Californian*, is not more than two thirds of the average.

IN ANSWER to your question on p. 705, friend Root, a late *Bienenzeitung* gave among other items from an apparently careful observer, an account of a queen fertilized the second time.

AT THE WORLD'S FAIR some of the finest-looking sections are shown lying on the side. It helps to make a better show, for the wood of the case covers up any imperfection at the sides of the section.

BEET SUGAR is still bitterly opposed in England as food for bees. If there is any chance of cane sugar being any better, I'm sure the cane may as well be used. But how are you to tell whether sugar has been made from cane or beets?

JUST WHEN we think we have something settled, along comes a batch of statistics from that troublesome old bach, Hasty, and knocks things endwise. Taking his table as a basis

(p. 700.) it seems we might cut queen-cells 5 days after swarming, and again 6 days later. But I wouldn't pin my faith to cell-cutting anyhow. All the same, that's a valuable table.

THE ST. LOUIS MARKET, which I visited a few days ago, hadn't a single section that I saw that a bee-keeper would want to set on his own table, even if there were no company present. That market seems to be largely for extracted honey.

GRAVENHORST agrees with Dzierzon, that one reason of the fatality in winter and spring in America lies in single hives and another in hives with movable covers. Remember their covers are fast, and the frames handled from the side or bottom.

THE WOMEN-FOLKS from our house are going to be represented at the Chicago convention. Why not from everywhere? Let's have a family gathering, and have a jolly time getting acquainted. How many women are going from Medina, Bro. Root?

PREVENTION OF SWARMING is one of the live topics; but too often an article on prevention begins, "When a colony swarms," and then I sadly pass it by without further reading. I don't want to know what to do when a colony swarms, but how to keep it from wanting to swarm.

QUITE A DISCUSSION is going on in *A. B. J.* as to the amount of honey on exhibition in the World's Fair by the State of New York. But there will hardly be an agreement so long as one figures only the sections that can be seen as on exhibition, and the other counts all that are in the case.

STARVATION is sometimes mistaken for paralysis, according to H. F. Coleman, in *A. B. J.* When no honey is coming in, he says the bees do not feed each other; and young bees hatching out of the central combs starve to death, although plenty of honey may be two or three comb away—a new idea, whether correct or not.

DR. TINKER reports, in *A. B. J.*, an apiary of 11 colonies of the ugliest bees to handle he ever saw, located close to the business center of a city, and they have never stung any one outside of the fence that incloses them, although several families live very close, and one not over 40 feet from the bees. He doesn't say how high the fence is, but I suspect it's pretty well up.

THE LANGDON non-swarmers have been reported as smothering swarms because there is room for only one bee to get out at a time. I have doubts about that. I suspect that the passage was stopped entirely. Mine was by a

dead drone. Bees ought to be able to get out of a hive one at a time before danger of smothering. But the exit of the cone can easily be made larger.

MY EXPERIENCE does not agree with that given by Bro. Hutchinson on page 712. Swarms uniting, and swarms returning to the wrong hives, are sources of trouble with clipped queens, without doubt. But I see no reason why swarms without queens should unite more readily than those with queens, and a large experience through many years makes me think they do not. And when they do unite, I think a majority of the bees get back to their own hives.

C. H. J. GRAVENHORST, the editor of that ably conducted German bee-journal, *Illustrierte Bienenzeitung*, is no stranger to the readers of GLEANINGS, having contributed to its columns. From his writings, and the vigorous manner in which he edits his paper, I have always thought of him as a man in the thirties or forties. What was my surprise to learn lately that he had just reached his three-score years and ten! He must grow on good soil.

CELLAR WINTERING, ETC.

A SEASONABLE ARTICLE BY G. M. DOOLITTLE.

A correspondent writes: "I desire to try cellar wintering with my bees the coming winter, as I have not been very successful in wintering out on summer stands. Will it do to put the bees in a cellar where persons are going in after vegetables every day? and how is it best to arrange the bees and cellar? Please reply through the columns of GLEANINGS."

A cellar which will keep vegetables will answer very well for the bees; and the going into it every day need not disturb wintering bees if the persons entering are cautioned about jarring them, or needlessly disturbing the hives, especially if the bees are placed so that the light from the lamp does not strike where it will shine into the hives. If the cellar is kept dark during the winter, all that is necessary to do is to hang a thick blanket in front of the hives to dim the rays from the lamp; but if the cellar is light, a place in one corner should be partitioned off so as to make the part which is to contain the bees dark. Bees have been wintered well in cellars where the light of day was allowed to enter; but as a rule, bees winter best in a cellar into which no light from the sun ever enters while they are in it. The hives should also be up one or two feet from the cellar bottom, the bench or platform on which they stand resting on the ground, instead of being nailed to the sleepers above, otherwise the jar caused by any movement on the floor above would disturb the bees, and tend to make them uneasy, thus causing their loss. Rats and mice should also be excluded from the cellar where bees are to be wintered; for of the two I would rather chance the jar of children playing over bees than of rats and mice running about and through the hives. Many bees are lost each year from rats and mice in cellars during the winter. The full entrance to the hive should be given where fast bottom-boards are used; and with movable bottom-boards the same should be left on the summer stands, and the hives raised two or more inches above the bench or hives on which they rest. Where honey-boards are used, I prefer to remove them, substituting several thicknesses of old carpet, or else a chaff or sawdust cushion two or three inches thick, through which the

moisture from the respiration of the bees may escape, but still keep them dry and warm. The bees should be set in about the middle of November, and taken out about the time the soft maples and elms are in bloom. Some recommend setting in later and taking out earlier; but my experience has been that the sudden changes, both in the late fall and early spring, are very damaging to bees, whether wintered in the cellar or out of doors, and it is best to avoid them where we can as well as not, as is the case in cellar wintering.

A few still recommend taking the bees out during a warm spell in winter, to give them a fly, so they can void their feces; but if they are quiet, I consider it much better to leave them undisturbed. Bees can retain their feces five months in the cellar much easier than they can three and one-half months out of doors, providing the cellar is suitable to winter bees in at all. The right temperature of a cellar to winter bees well is from 42° to 45°; but if fixed as above given, they will do very well as low as 35° to 40°. If the cellar is one where the temperature goes as low as the freezing-point, and stays there any length of time, I should prefer to leave the bees on their summer stands, unless I had some suitable means of warming it which was easily controllable; for a continued temperature at about the freezing-point, or a little below, seems to be very injurious to bees.

UNITING BEES.

Another correspondent writes, saying: "I have some weak colonies of bees which I fear will not winter as they are. How would it do to unite two of these weak colonies together for winter?"

This is the proper thing to do, for two weak colonies kept separate will consume nearly twice the stores which both would unite, and very likely perish before spring; while, if put together, they would winter as well as any large colony. My way of uniting such colonies is as follows: If one of the queens is known to be feeble or inferior, hunt her out and kill her, so that the best queen may survive; otherwise, pay no attention to the queens, for one of them will soon be killed after uniting. Having the queen matter disposed of, go to the colonies you wish to unite, and blow smoke quite freely in at the entrance, pounding on top of the hive at the same time with the doubled-up fist. When both have been treated in this way, wait a moment or two for the bees to fill themselves with honey, when one is to be put on a wheelbarrow and wheeled to where the other stands, and both opened. Now select out the combs from both hives which contain the most honey, setting them in one hive. In thus setting in, it is always best to alternate the frames, whereby the bees are so mixed up that they generally have no desire to fight, for each bee touched by another is a stranger. After the hive is filled, arrange the quilt or honey-board, and put on the cover. Next put a wide board in front of the hive, leading up to the entrance, and proceed to shake the bees off the remaining frames, taking first a frame from one hive and then one from the other, thus mixing the bees as before. After all are in, set a board up against the front of the hive, sloping over the entrance, so that the next time the bees fly they will bump against it, thus causing them to mark their location anew, so that they will not return to their old place and get lost. Also remove all relics of the old hive, so there is no homelike look about their old location to entice them back. Put the remaining combs away in some safe place for the next season's use, and the work is done.

Borodino, N. Y.

G. M. DOOLITTLE.

RAMBLE 93.

NEW OR OLD COMBS.

The delightful and invigorating experience I enjoyed in Cold Water Canyon gave me a desire for a still further experience of nearly the same kind in the higher altitudes of the noble San Bernardino Mountains; and on Aug. 10th the Rambler might have been seen astride a fine horse, loping across the country from Redlands to San Bernardino, a distance of nine miles.

The benefits of a horseback ride, from the point of view of health, can not be overestimated. There is not a corpuscle of blood, nor a ganglion nor a nerve center, but gets shaken up; and there can be no stagnation in the system of an habitual horseback-rider. The fresh morning fragrance of the gum-trees, in

one. If four old combs and four new ones are inserted in a super, either alternate or each four by themselves, the four old combs will be filled with honey before the new ones show much honey. Experiencing this inclination of the bees in such a marked manner, we concluded that the reason why the honey was stored in the old combs was their better heat-retaining qualities, and that the ripening process was more rapid in such combs. Another point, these old black combs are renewed to a much greater degree than many think. The uncapping process, the inroads of the moth-miller, and various mishaps to the comb when used for several years, renew the outer ends of the cells if not the base; and we left the discussion of old versus new combs with a resolve to never throw away a good comb, even if it were black with age.

We also agreed upon the generous use of foundation; and upon a comparison of notes found that there was much difference in the working of mills, even from the best of care in the manufacture. Although the Root mills are made with care, and nicely adjusted machinery, there seems to be one occasionally that refuses to do good work. The Rambler brings vividly to mind a California bee-keeper who was struggling with a mill that had a kink for contrariety in it; and said bee-keeper was not only sweating, but using very profane language

with every thing connected with the mill. A few days after I called again, and satisfied smiles wreathed the face of the former profane man, and the cause was a new Root mill which worked like a charm, and beautiful section foundation was being rapidly rolled out without a hitch.

Mr. F. had experienced trouble of a similar kind, except the swearing; and I mention the above fact as a sort of hint to the makers of foundation-mills in the Home of the Honey-bee, that their best machines are real missionaries among those who are inclined to be profane when crosses are laid upon them. This should surely be an incentive to make every mill a perfect one, as I have no doubt they now are, for the bad-working mills were made at an earlier date.

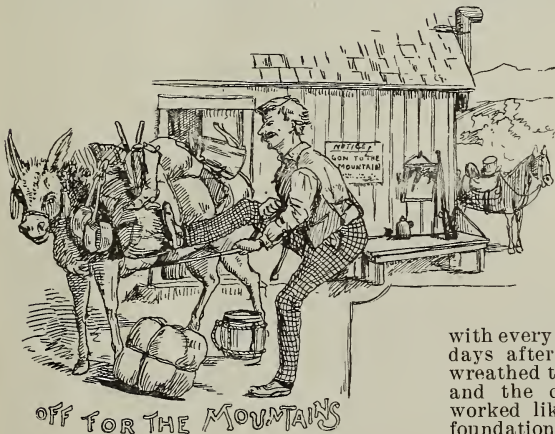
In the midst of our conversation my traveling companion Wilder came brushing through the orange-trees, mounted on a large gray horse, and leading the bronco Vick, with a jack saddle loaded down with camp equipage and two guns. Our friend, who is very urbane and well poised in demeanor, was evidently laboring under great excitement; and, leaping from his horse, he proceeded to inform us, with much suppressed emotion, that the greatest advance ever made in bee culture was about to be accomplished.

"Do tell!" said I.

"You don't say!" said F.

"Well, gentlemen, the working time of the honey-bee is about to be doubled. It may seem to be a mean trick to play upon the already overworked bee; but the fact is, a report comes from the World's Fair that a California bee-keeper, not yet satisfied with his wonderful yields of honey, is trying to breed a cross between the Italian bee and the American lightning-bug. The great advantage is apparent—the bee can then carry its own light, and work night and day."

"Wonderful! remarkable! eureka!" shouted Mr. F. and I, rising in excitement to our feet.



the shade of which I galloped, and the companionship of a strong and noble animal, were also factors not to be lightly considered. A recent writer claims that the evidences of revelation and reason prove that there is a future life for horses; and if any animal deserves the honor of a happy future it is surely the noble and useful horse. When we descend from the horse and get astride the cycle we lose the companionship, for the latter is only a machine, and that is where it fails in its comparison to a horse.

My destination was the ranch of our bee-keeping friend Mr. Geo. Ferguson, a little beyond San Bernardino. At this rendezvous our friend Wilder, the expert hunter and camper, was to meet me, and from thence we were to strike direct for the mountains for a sojourn of several days. Arriving some little time ahead of my friend I had the opportunity of visiting awhile with Mr. Ferguson, who was busy irrigating his field of corn. We gradually drifted to the house and the shade, and our conversation there naturally fell into the topics of bee culture; and old versus new combs were fully discussed. While we find now and then a bee-keeper who advocates the renewing of his combs with new foundation every four or five years, we rarely find one who puts it into practice. Mr. F. said that he never renewed a comb as long as it could be used, and he had some in his hives that he knew were fifteen years old. The Rambler had also used combs in his eastern apiary that were twelve years old, and in both cases no bad results were visible. In the use of old combs our experience was similar, in observing that bees will store honey in an old comb in preference to a new

"There is one obstacle, however, to overcome," said our friend; "and that is, to get the light located in a position of the bee's body where it will do the most good; and it is thought best to turn the matter over to some expert breeder of bees. Now, gentlemen, whom would you suggest?"



THE ELECTRIC BEE.

"Well, gentlemen," said I, "you know that I have admired and advocated Henry Alley's system of queen-rearing, and, furthermore, Mr. Alley has a way of getting there second to none in the bee-keeping world. He has bred the yellow Carniolans from a gray race, and says he can also get there with yellow Punicas, and I haven't the least doubt in the matter. Now let's give him a chance upon this lightning-bug scheme."

We all arose with a cheer for Alley and another for the California lightning honey-bee.

So far as California bee-keepers are concerned, I never saw a class of men so enthusiastic over a project as they are over this when it is first mentioned to them. They literally hug themselves with delight. With the many other improvements in progress there is nothing to prevent California from supplying the whole wide world with honey.

Our discussion of these great questions delayed our dinner somewhat, but we got to it at last with sharpened appetites. At precisely three o'clock, after the heat of 102° in the shade had somewhat subsided, we started for the mountains, loping off across the plain, kicking up a big dust, and shouting to our pack-horse to keep her on the gallop. In the twilight hour we entered Devil's Canyon. Above us, upon an immense and precipitous hogback, is pointed out to us the old Mormon trail by which the first white men came into this valley. One can almost imagine their surprise and delight, after days of hardship over the Mojave Desert, with their slow-moving ox-teams, to look down from this lofty height into a broad and fertile valley. Thus the Mormons came; better passes were soon discovered, and the old trail abandoned; but the washings of winter rains have so deepened the trail that the old landmark bids fair to remain there for ever.

The cooling streams of the canyon, and the agreeable shade and change from the hot plains, makes this a resort of many camping-parties; and I have no doubt that many more would be found here but for the rough nature of the place, which, with huge boulder and precipice, leaves but scant room for pitching a camp.

There is an abundance of honey flora in the mouth of this canyon, and it is taken advantage of by Mr. Joe Marshall, who has an apiary located here. It required something of a climb to get to the cabin, for it is hung, as it were, upon the steep side of the mountain. We found the house well anchored to the ground with brace-poles, for at times the wind howls through this place with great violence—Devil's Canyon!

We found the cabin a very good place to

spend the night; and, in the absence of the owner, we picketed our horses in what we thought a patch of weeds; but when the light of morning came we discovered that our horses had spent a comfortable night in the garden; but inasmuch as our animals ate more weeds than "garden sass," we thought the damage not beyond our limited means, and stand ready to make amends for our blunder, which was made under cover of darkness.

Our night's rest was comfortable in the cabin—the last one we were to have for many nights. Partial to a good spring bed is the

RAMBLER.

THE ATCHLEY FAMILY.

AN ACCOUNT OF THE LARGEST QUEEN-REARING ESTABLISHMENT IN THE WORLD;
METHODS EMPLOYED, ETC.

I will begin on the left. The first person is Willie. He is holding two frames with cells on them. The frame in his left hand has 25 cells nearly ready to hatch. They were built by two colonies, but all put into one after they were sealed. In his right hand is a frame with cell-cups just grafted, ready to place in a hive for the bees to go to work on. On the right-hand corner of the table are his two wax-cups. One of them is to be placed over the lamp; and at any time when the wax happens to get too hot he slips it off and puts on the other one; or when the wax gets too low in one cup he uses the other, etc.

Leaning up against the wax-cups are the cell-sticks, five in a group. Every time he dips he makes five cells, dipping six to eight times to get good stout cell-cups. Next you will notice a little box full of holes. This is about the size of a common cigar-box, with $\frac{3}{8}$ -in. holes. This is where the cells are placed while being moved. All are set in the holes point down, and can be carried quite a distance without injury. The next box is a similar one, containing his grafting-tools. You can see the razor with which he pares down the cells before lifting out the cocoons. Willie's main work is to dip his cell-cups in the early morning, while it is too cool to graft. In about half an hour he can dip what cells he will need during the day; then he goes to moving cells that are ready to hatch, into nuclei. This he usually works at till about ten o'clock. Then he and his ma begin grafting, one doing the grafting and the other placing the cell-cups in the cell-building colonies, taking it time about as we get tired. Then when the grafting is done for the day, Willie cages queens and looks after all the yards the remainder of the day.

The next person is Charlie, with his saw and hammer in his right hand, and his plane in his left. His post has been to nail up nuclei and prepare all shipping-boxes, etc. He also has a yard of nuclei to attend to, where he may be found, every chance he gets, doing his own grafting and caging. He has raised some section honey.

Just in front of Charlie is little Leah. She is one of the best helpers in the yard, for her size; and all during the day can be heard the words, "Leah, bring me a frame of brood from number so and so;" or, "Bring me an empty comb;" or, "Go cage a queen from No. 20," and all such as that. She can graft cells too, and has a yard of her own.

The next personage I will call your attention to is little Ives, sitting on a bee-hive. He has a frame of bees in his hands; and while the artist is trying to draw his attention he looks up at him, but goes right on blowing the bees



away and taking a bite of sealed honey. He is just two years old, and has often been found in different parts of the apiary with a hive open and a frame out, eating honey without smoke or veil; and when asked what he was doing he would say, "Awful good honey."

Just behind little Ives stands Mr. Atchley, who has been in bad health for many years, not being able to do any hard work; still, he is able to help keep up the correspondence, and works about the house at any thing needing to be done. While he has opened but few hives this year, he is thoroughly posted, and is a great teacher in apiculture. You will notice his left hand resting upon an A B C book, which he thinks stands without an equal as an instructor on bee-matters.

The next is your humble servant, with right hand hold of a type-writer, and left hand resting on "Doolittle on Queen rearing," to which we are indebted for giving us the inside track on raising queens on a large scale. It is useless for me to try to tell you what part of the work I perform, as I do some of all, going here and there pointing out things to be done, then, after the day has faded, I often hear the clock strike eleven before I lie down, and have gone to sleep with pen in hand. I looked a little careworn the morning the photo was taken, as it was on the morning of July 14th, about 8 o'clock (my birthday). I had been going at breakneck speed to get the house set to rights before the artist came. I am now 36 years old.

The next person, and standing close by my side, is little Rosa. She has a queen-cage in her hand, and she carries queens from the apiary to the house, where they are fixed up for the mails. While she does not take to the bees as does her sister Leah, she has her own bees also, and is said by Willie to have the best luck of any of the children, with her queens, as she seldom loses one in mating or otherwise.

The next is Amanda. She makes the most of the queen-candy, and she has become an expert at it too, as we have lost only a very few queens this year. She has bees of her own, and helps at any thing that comes up, including the cooking and housekeeping, and sometimes helps Willie dip cell-cups, grafting, etc., and is a fast hand at the extractor, she and Willie going three miles to an outyard this year and taking in one day a barrel of honey, besides doing other work in the yard. She is one of the best bee-keepers I have; and from the correspondence I have noticed lately from New York, I am getting a little scared, as I can not afford to lose one of my best bee-keepers just at this stage of the game.

The next is Napoleon, standing by the baby-carriage, with a frame of bees in his hand, resting it on the corner of his wheelbarrow. He does nearly all the hauling, as well as attend to his bees. He has raised quite a lot of queens himself this year, and has now just come up from his bees, and set his smoker on his wheelbarrow. He can place a hive of bees on his barrow and carry it to Charles, to be made into nuclei, and then scatter the nuclei quickly, or can do almost any thing that is to be done. He is going to be a bee-man some day, if he lives, notwithstanding he loves chickens. He sent to Mrs. Axtell last spring, and bought him a sitting of fine Plymouth Rock eggs; and out of thirteen he has raised nine fine chickens.

Last and least is little Thomas York, two months old; and his advent into the world made but little check in the queen-yards, as his mamma lay on the bed and grafted 200 queen-cells when he was but two days old, besides changing and recaging some queens that had come in by mail. He is trying to see how loud he can cry while the artist is trying to

catch him quiet. He has good lungs, so says the artist.

Now I have given a part of the work that each performs; and when any branch of the work is getting behind, any or all take hold of it and help up. We can all be seen around a table at times, some making queen-candy, some fixing cages, some dipping cells; and while each one usually knows his line of work, he is often called on to perform any duty that comes up in the yards.

That part of the house shown is the southwest corner of the front gallery, and a portion of one room, with a cluster of running roses and morningglories for a background. While we have bought only about 600 queens this year, we are above the 4000 mark, and shall likely reach 5000 this year. There has not been a single day's work done in the yards by any one except the family; but we hired a man to transfer two days. So, dear readers, I leave you to judge as to whether we have worked or played.

JENNIE ATCHLEY.

Greenville, Texas, Aug. 16.

[The following is a letter from a correspondent who had visited the Atchley yards:]

I have just come from Mrs. Jennie Atchley's, the greatest queen-breeder in the world, and I saw the boy that raises the most queens of any one in the world. Willie Atchley is the best and most extensive queen-breeder in the world. I saw him dip his cell-cups, and saw him extract the larva from the comb, and place it in the cells. He puts up, on an average, 150 cells a day, and grafts and removes as many ripe cells, besides caging a large number of queens, and does other work. Mrs. Atchley has between 800 and 1000 hives. All are run for queen-rearing. I visited all of their yards. They have five out-yards and one at home. They have 500 or 600 hives at home. They receive orders from all parts of the globe. They received two orders on the 10th from New Zealand and from Queensland—one for half a dozen, and the other for 20 pounds' worth. You ought to see little Rosa and Leah cage queens. Miss Rosa is 8 and Leah 6 years old.

Ozan, Ark.

J. W. TAYLOR.

EXPERIMENTS IN APICULTURE.

SOME VALUABLE WORK DONE BY J. H. LARRABEE, FORMER APICULTURAL EXPERIMENTER AT THE MICHIGAN AGRICULTURAL COLLEGE.

A few weeks ago we received Bulletin No. 30, of the United States Department of Agriculture, containing in the latter part of it the report of the experiments in apiculture by J. H. Larrabee, at the Michigan Agricultural College. We intended to make notice of it before; and now having read it over, at least the apicultural part of it, we have decided to publish it entire, although our space is, as usual, crowded. Mr. Larrabee made an excellent experimenter; and we hope the department will see its way clear some time to engage his services again.

We commend the following report to the careful attention of our readers:

During the season of 1892 the branch station for experimenting in bee culture at the Michigan Agricultural College was continued at the expense of the U. S. Department of Agriculture, Division of Entomology, and of the Michigan State Experiment Station.

An effort was made to undertake a line of experiments closely connected with the practical work of the apiary. While all of the experiments undertaken have not given results of practical value, some have. Especially gratifying are the results

obtained in the experiments upon the subject of wax secretion and the evaporation of honey, for the reason that they were nearly free from those elements of uncertainty that must necessarily enter into nearly all experimental work in the apiary, such as season and condition of bees.

When the bees were taken from the cellar, on April 18, they were in rather poor condition, due doubtless to the dampness of the cellar and the character and amount of the stores. The loss during the winter and spring was about one-third of the number placed in the cellar.

In May and June the bees of the whole apiary were transferred from the old hives into the modern dovetailed hives, and from the old reversible frames, of three distinct sizes, to the new, wide, thick-top-bar frames of the Langstroth size. In this operation all drone comb or other imperfect combs were rejected and rendered into wax. By this change the apiary was placed upon a modern footing, the hives made uniform, the operations and manipulations of the apiary rendered more rapid, and its beauty and value increased.

The spring was very backward and rainy. During fruit-bloom the bees flew but little, and their influence upon the fertilization of the flowers of our fruits is seen in the almost complete failure in this vicinity of all tree fruits and others largely dependent upon the bees for the dissemination of pollen. As the rainy, cloudy weather did not cease until about the first of July, the early part of the clover bloom was lost to the bees. No supers were put on until July 8, and at that time strong colonies were swarming, with almost no honey in the hives. All of the white surplus was taken from basswood, which yielded well. July 25 the season for white honey closed. A little surplus of late honey was gathered during August, and the bees filled up the hives well for winter. A yield of about 25 pounds of surplus per colony was obtained, and there are now in the apiary fifty-five colonies in excellent condition for winter.

BREEDING.

During the year 1891 the apiary was entirely re-queened, only a few old queens being reserved for breeding. This season the opportunity was taken to replace all those of the former year's rearing that had proven themselves inferior. A number of Carniolan queens were introduced, and queens bred from them. Added familiarity with the cross of the Carniolan bee with the yellow race increases my satisfaction with their valuable traits. They have proven themselves fully as desirable as either race in its purity, and they have some points of superiority.

A test was made of the claims advanced for Tunisian, or so-called "Punic" bees. During the early part of the season they exhibited no traits that would distinguish them from the native black bee, showing the same nervousness under manipulation. They build large numbers of queen-cells, and do not cap their honey with that peculiar whiteness characteristic of the common black bee. After the close of the honey season they best showed their origin and distinctive peculiarities. Whenever attempts were made to handle them they became exceedingly angry. This trait of excessive irritability seems to be their most distinctive mark. As no point of superiority was discovered, their several manifest defects make them a race not to be recommended as desirable for introduction among our American bee-keepers.

REMOVING THE QUEEN TO PREVENT SWARMING.

As the bee-keeping industry develops and new methods and devices come into use, each tending to lower the price of the product, an increased tension is placed upon the apiarist in an effort to manage large numbers of colonies to increase his annual yield. The natural tendency of bees to increase by swarming and the care and attention occasioned thereby have given rise to various plans for its prevention or control. One of the best of these plans, yet one little used, is outlined in the following, the value of which, at the suggestion of Mr. Atkin, of Loveland, Colo., I undertook to test: Early in spring two colonies were selected, as nearly alike in strength as it was possible to get them. These were kept at the same strength, the amount of brood in the hives having been equalized several times. The harvest did not open until about July 6, and upon the 8th supers were given them. July 12, queen-cells were found partly constructed in colony No. 1. The queen was removed, and four days and

also eight days afterward all queen-cells were destroyed. On July 25 (thirteen days after her removal) the queen was returned. This colony did not swarm at all. The other colony (No. 2) was allowed to work without interference, and it was not until July 21 that they swarmed. As the harvest from linden was about closing, the swarm was returned and all queen-cells destroyed, in the hope that they would not attempt to swarm again before the close of the season. They did not swarm, yet it may be supposed that this interference with their instincts tended slightly to decrease their energy. The results in total amount of honey gathered are as follows: No. 1 gained in weight 37 pounds between July 6 and 25, and No. 2 gained 46 pounds during the same time.

If from the total gain of No. 2 we subtract 5 pounds as the weight of brood it contained in excess of the brood in No. 1 on July 25, we still have 4 pounds as the amount of honey gathered by No. 2 greater than the amount gathered by No. 1. These colonies were both worked for comb honey with like treatment of supers.

This experiment is valuable testimony to prove that the removal of the queen to prevent swarming does somewhat affect the amount of honey gathered by the bees. The supers showed even a larger difference in the amount of honey stored in the sections, for the reason that, where the queen is absent, the bees fill the brood-chamber with honey. When the queen is returned this will to a greater or less extent be removed to the sections. Although the interference in this manner with the economy of the hive probably always reduces the amount of honey stored, yet because of the lessening in the labor and watching necessary during the swarming season, I deem it advisable to follow this method when any similar plan seems necessary.

WAX SECRETION.

To determine the amount of honey consumed by the bees in secreting one pound of wax, this experiment, first undertaken in 1891, was repeated this year. As the conditions were much more favorable, the results were very gratifying. There was entire absence of a natural honey-flow, the weather was favorable, the colonies were of the same strength, and in prosperous condition, they took the food rapidly, and built comb readily. The result gives a less amount of honey as necessary to be fed the bees in order to have one pound of wax secreted than was obtained in this experiment last year. This was to be expected because of the more favorable and exact conditions. Two colonies were taken which I have designated as Nos. 1 and 2. No. 1 was given a virgin queen and no comb or honey. No. 2 was given a virgin queen and empty combs. It was noticed that the bees did not fly from either of these hives as vigorously as from the others of the apiary, and that No. 1 was the more quiet of the two. Twenty-four and a half pounds of food were given, and almost exactly 1 lb. of wax was secreted by No. 1. By weighing the combs both before and after being melted and taking the difference, the amount of pollen was ascertained. In both colonies the young queens had begun to lay, having been fertilized during the ten days the experiment was in progress. I now feel confident that more careful work on the part of others who have undertaken to solve this question will give practically the same results as are summarized on the next page.

PLANTING FOR HONEY.

There were in bloom at the station this season three acres of sweet clover (*Melilotus alba*) sown in June, 1891. It was sown on rather poor clay soil, yet it made a fair growth last fall and came through the winter in good condition. It began to bloom July 8, and continued in bloom until the 20th of September. The period of greatest bloom and honey secretion was from July 20 to September 1. It grew rapidly and was very rank, reaching a height of about six feet. The amount of bloom was great, and the bees were continually busy upon it; yet during the period from July 24 to August 10, while it was in full bloom and while all other natural sources were absent, no honey of any appreciable extent was gathered, and the hive upon scale lost in weight. Probably some honey was obtained during the season from this sweet clover, but in such limited quantities as to make any estimate of the value of the plant as a honey-producer impossible. At the present time the ground is covered with brush, so that labor will be necessary in clearing the land before plowing can be done.

With the idea of obtaining an opinion of the value of sweet clover as a silage plant an alcohol-barrel was filled with the cut stalks, solidly packed, and sealed air-tight. This was done on July 14, just as the clover was getting fairly into bloom, and while the stalks were yet tender and nutritious. On September 23 the barrel was opened and the ensilage was fed. A horse that had previously eaten corn silage ate it very readily, but another horse and a cow that had never eaten silage would not touch it. Several experts on the subject pronounced it excellent. There is no doubt but that it would be a very desirable plant for the purpose if the feeding value per acre could be made equal to that of corn. An estimate from the amount cut for silage gave between 6 and 7 tons per acre. Although its feeding value may be much higher than that of corn, it is still doubtful if it will pay to use it for this purpose alone, from the above estimate.

In concluding these experiments in planting for honey carried on by Prof. Cook, and now concluded for the present, I desire to say that no results have been obtained with any plant sown or planted for honey alone that will warrant the bee-keeper in expending money and labor in this direction. Bee-keepers have in the past spent much time and money in the effort to cultivate some plant for the honey the bees may obtain from its flowers. In no case coming under my observation have these efforts been a success, and the practice has never been continued at a profit. Therefore let me caution all apiarists against spending money in the attempt to cultivate at a profit any flower for honey

sure method to assist the bees in this work. For this purpose there were constructed a series of six shallow pans, 19 by 28 inches in size, with partitions 2 inches in height, open on alternate ends, similar to the partitions in a maple-syrup evaporator. These were arranged in a cabinet, one above the other, so that honey entering at the top was obliged to flow some 75 feet before passing out at the bottom. An oil-stove was placed beneath the whole, and a pipe at the top caused a current of heated air to pass upward over the honey. The fumes of the stove were carried off by means of a second pipe, in order to avoid all danger of their injuring the flavor of the honey. Honey of average body, with 10 per cent by weight of water added, was reduced again to the normal condition by passing twice through the pans at a temperature of 120°, and about 100 pounds per day was evaporated at that temperature. Thin nectar, extracted from the hives very soon after being gathered, was evaporated to the thickness of good honey at about the same rate. This apparatus was kept in operation about ten days upon honey of various thickness and upon clear water with the above definite results. The flavor of the first honey was injured—probably by the first acid action of the honey upon the outer coating of the tin. Afterward this was not as apparent. The color was also somewhat affected. The heat of the sun was also tried for purposes of evaporation. A shallow pan 28 by 54 inches in size was filled 3 inches deep with thin honey. This was covered with glass 6 inches above the honey, and left in the sun for four days, when about 5 per cent of mois-

Wax Secretion.

	Colony No. 1.		Colony No. 2.	
	Lbs.	Oz.	Lbs.	Oz.
Weight of bees.....	7	5	7	3
Gross weight, Aug. 2, with bees.....	27	8	34	4
Gross weight, Aug. 12, with bees.....	42	10	56	8
Gross gain in weight 10 days.....	15	2	22	4
Feed given.....	24	8	24	8
Minus honey extracted.....	12	8	20	8
Leaves honey consumed.....	12		4	
Honey consumed by No. 1 in excess of No. 2: 12-4=8 pounds.....				
Wax secreted by No. 1.....	15½			
Pollen in combs at close.....	1	8	2	
Honey, wax, and pollen removed (8 pounds honey consumed in secreting 15½ ounces of wax).....	14	15½	22	8

alone. Bee-keepers should cease these useless efforts and turn their attention more persistently to extending the area of all wild honey-producing plants, and urging upon all the superiority of alsike clover and Japanese buckwheat as farm crops and the linden as a shade-tree.

EVAPORATION OF HONEY.

Nectar of flowers taken into the stomach of the bee undergoes certain chemical changes before it is finally deposited as honey in the cells of the honey-comb. The recent analyses, by direction of the United States Government chemist and those instituted at the Michigan State Experiment Station, prove that there is no chemical change made in the honey by the bee after it is deposited in the comb. There remains, however, much water in this honey that must be evaporated by the heat of the hive and the current of air through the hive caused by the fanning of the bees. It is well known that this labor of evaporation and the room occupied by this thin honey interferes greatly with the rapid gathering of nectar. In this opinion I am confirmed by a study of many records of colonies placed upon scales during the honey flow. It is often desirable to extract all of the honey gathered from one species of honey-plant before the flow from other sources begins and before the former has ripened to the usual consistency of good honey. The property of granulation in honey is so troublesome that its prevention would be very desirable. The experiments in this line have plainly indicated that the "water of crystallization" can be easily expelled by a proper artificial heat and the product sealed, so as to preserve it in a liquid state for an indefinite time. For these reasons it was thought best to experiment in this direction with various forms of artificial heat in the effort to devise some cheap and

ture was evaporated. As the honey lies at rest, the water rises to the top, somewhat aiding evaporation. The flavor and color are not affected as much as by the method of running through pans. In this way honey with 30 per cent, and even 40 per cent, of water added was evaporated to the consistency of very thick honey in three weeks' time, so thick that it has not at this date showed any signs of granulation. During favorable periods of sunshine a temperature of 165° was reached. By this method a tank 4 by 6 feet, with 6 inches of honey, and weighing 1300 pounds, should be evaporated 10 per cent, or from the consistency of freshly gathered honey to that of average body, during about two weeks in July or August.

The common method of exposing to the air in open vessels in the warm upper story of a building was also tested with honey to which 10, 20, 30, and 40 per cent of water had been added. That having 40 per cent added became strongly fermented in a week's time, while only a slight change had taken place in the 30 per cent dilution, and at the end of a month it tasted like a very poor quality of commercial extracted honey or like honey-dew. The 20 per cent dilution was not nearly as bad, and the honey with only 10 per cent of water added was, during the month, returned to the consistency of very fair honey.

Nectar extracted two or three days after the combs were placed in the hives contained, during the dry weather of July and August, from 10 to 15 per cent of water above the amount always found in honey that has been sealed in the comb by the bees. This was determined by evaporating in test-tubes in hot water.

Summary.—(1) The method at present promising best results for artificial evaporation is that by solar heat under glass well ventilated. A small

portion of a greenhouse or forcing-house arranged for conserving the heat of the sun, and so located that honey could be run into the shallow vats directly from the mouth of the extractor, and drawn off from the bottom of the vats into marketing-receptacles, should give good practical results.

(2) Very thin honey or nectar will not sour as quickly as supposed by many, and may be safely kept during any period of cloudy weather we may have during the hot summer months.

(3) The method of exposing to air in a warm room can not be depended upon to ripen very thin honey, although it may be serviceable for evaporating a very small percentage of water.

(4) The method of evaporating by artificial heat of stove or furnace is expensive and troublesome, requiring constant watching and care, and not giving as good results as had been hoped for.

(5) The possibilities in the line of evaporating honey for the purpose of increasing the yield and preventing granulation are very great. A series of experiments to determine the increase in production by extracting freshly gathered honey would be next in order and value. When the utility of this method is fully demonstrated, supers with fixed frames and extractors holding whole cases will be used, and other apparatus conformable to the needs of the new system.

FEEDING BACK.

Feeding back extracted honey to secure the completion of unfinished sections at the close of the harvest is practiced by some apiarists, but with varying financial success. Extracted honey can be transported long distances with much greater safety than can comb honey. For this reason it has been thought it might be profitable to feed bees extracted honey costing 7 or 8 cents per pound to produce comb honey selling at 13 to 15 cents, locating the apiary designed for this purpose near a large city or other favorable market. With the idea of adding light upon this subject, extracted honey was fed to a number of colonies under the following conditions: The hives were contracted, and the queens kept in the brood apartment by means of excluding zinc. Five colonies were given two crates each of unfinished sections, the sections of the whole weighing 133 pounds. Three hundred and thirty-eight pounds of honey were fed these five colonies during twelve days. The honey was thinned with 12 per cent of water, and warmed before feeding. The amount of finished honey obtained was 367 pounds, or a gain of 234 pounds by feeding 338 pounds of honey. The hives were weighed both before and after the honey was fed, and a gain of 36 pounds during the feeding recorded for the five hives. The following gives the results from a financial view:

254 pounds comb honey by feeding at 14 cents	\$35 56
36 pounds stored in hives, at 8 cents.....	2 88
	<hr/> 38 44
Minus value of 338 pounds fed, at 8 cents.....	27 04
	<hr/> Profit as pay for labor, etc..... 11 40

Two colonies were given crates of sections with full sheets of foundation, and were fed extracted honey, under the same conditions as the five colonies above:

	Pounds.
Amount of honey fed each colony.....	66½
Colony No. 1, finished comb honey.....	41½
Colony No. 1, gain in weight of hive.....	9
Colony No. 2, finished comb honey.....	38
Colony No. 2, gain in weight of hive.....	7½

Taking these two colonies as a basis, the following financial statement is made:

79½ pounds comb honey at 14 cents.....	\$11 13
16½ pounds honey stored in hives, at 8 cents...	1 32
	<hr/> 12 45
Minus value of 133 pounds honey fed, at 8 cts..	10 64
	<hr/> 1 81

Deducting from this profit the value of the sections and foundation used, the actual profit, as pay for labor, etc., is, at most, nominal.

When this whole experiment was begun, and during the time it was in progress, no honey was gathered from the fields; but before the sealing was all accomplished, the fall honey-flow began, and for this reason the experiment was ended and the hon-

ey removed sooner than would otherwise have been advisable.

The results obtained in this work or in any experimental work of a similar character might vary under more favorable or unfavorable conditions of environment, and a continuation in various seasons and under other conditions would alone give really reliable results. The above trials are, however, very encouraging, and longer and varied work in this line is desirable.

THOSE OLD BEE-BOOKS.

ANOTHER PEEP AT THE "GOOD OLD TIMES."

James Bonner's treatise on bees was printed in Edinburgh in 1795. The book has no particular title other than "Plan for Increasing the Number of Bee-hives." Mr. Bonner was also the author of a work on "Warping;" but just what was "warped" does not appear—possibly a political speech or a sermon. The author's name is well known to all persons who have read much about the history of apiculture. His brief account of himself is full of interest. He had from the first a deep interest in bees, and he considers these especial bents of mind as gifts from God. His father was a devoted beekeeper—devoted to the feeding of twelve children—and boasted that, in good seasons, he made as much money by his bees as nearly purchased oatmeal enough for the family for a year. He purchased a large quarto Bible with the wax produced in one year.* A Scotchman and a quarto Bible are as much to be expected to complement each other as the two blades of shears. Who can fail to notice the connection between that nation of Bible students and the virtue, independence, and intelligence of the Scotch? The elder Bonner was a weaver, and followed his trade till within a few days of his death, which occurred when he was 86. Probably that weaving accounts for the "warping" I have referred to.

Our author says that he himself was so much interested in bees that, when he was 20 years of age, he went to London to converse with Mr. Wildman, the author of the book which I reviewed in the previous issue; but Mr. Wildman had gone to France, and so Mr. Bonner contented himself with purchasing every book he could find relating to bees, and, strange enough, he mentions every book I have so far reviewed. During the honey season he was so intent on the work of the bees that he hardly allowed himself to sleep for weeks together. He speaks of "the infinite number of mellifluous flowers" in his land. How many of the readers of these pages ever realized that Edinburgh is as far north as parts of Alaska, our arctic possessions, and that all of Scotland is east of Hudson's Bay? The idea of flowers in such a latitude as that seems strange; but as the land is so deeply indented all around by the ocean it is rendered a very good place for bees.

The year 1794 was memorable in Scotland for its remarkable flow of honey, and this led Mr. Bonner to believe that, if the number of bees in Scotland had been increased twenty or even fifty fold, all would have done well. So much carried away was our author with the idea of possible increase in bees that it reminds one of P. Benson's remarks on the increase of swarms and apples, as seen on p. 386, GLEANINGS, 1887. Mr. Bonner says: "Were there but one hive in all Scotland, in a cold rainy summer, even that hive would produce but a very small increase, perhaps swarm only once, and that swarm produce only one pint of honey; whereas if there

*It should be remembered that Bibles, as well as books in general, were much more expensive in 1790 than now.

are 100 hives, granting the weather to be equally bad, the produce must be at least 100 pints. Estimating the number of parishes in Scotland, capable of raising bees, to be only 800, the following calculation will give a view of the immense quantity of honey that might be produced in ordinary years: Suppose 1 hive to produce 4 pints of honey, 1 hive in a parish, 800, produces 3200 pints; suppose the number in each parish is increased to 30, the 24,000 will produce 96,000 pints; but suppose (which is still moderate) the number in each parish is further increased to 100, the 80,000 will produce 320,000 pints; and 400 in each parish would produce 1,280,000 pints of honey; and 1 lb. of wax to each colony would be 80,000 lbs."

Mr. Bonner says that his own parish, in 1794, would have supported 1500 colonies abundantly. He claims that all of Scotland could produce two million pints of honey, a pint being about a pound, besides 80,000 lbs. of wax. I am confident that Scotland can do better than that to-day. Can we have any statistics from there? Some counties in California, if I mistake not, do more than that.

While Mr. Bonner does not seem to think it would pay to plant or sow for honey alone, he shows the advantage of raising some things for the honey they produce besides food of other kinds; and his views are sound, and as applicable to this country as to Scotland. He says: "Should we plant some trees, with a view to assist bees, we have their wood; if we rear turnips, we have their feed; if we sow white clover, we have the best of pasture; and if we allow furze or broom to overspread waste ground, we can be at little loss, as even these have also their uses by supplying us with hedging, fuel, shelter for sheep, etc. I wish not to be here understood as if I meant to recommend the sowing of large fields purposely with food for bees, excepting white clover, which provides food for larger animals."

One of the advantages of cheap honey. Mr. B. assumes, would be the manufacture of mead, to take the place of ale and porter. Further, "A weaker kind of mead, called bragwort, could also be made of it. This is an agreeable wholesome liquor, much esteemed by many who use it as a substitute for small beer. When properly made it will keep long; and when of a proper degree of strength it is so highly exhilarating that many persons have been sent home half intoxicated with it."

The latter part of that quotation, "sent home half intoxicated," is a good reply to those who would substitute the light wines of California for some of the heavier drinks. The Spanish have a proverb which says, "As well eat the Devil as the broth he's boiled in:" that is, the essential spirit of all sins is the same. Whether the persons who were only "half intoxicated with it" were "sent home" on foot or on a shutter carried by friends, I can not learn.

Mr. Bonner is confident that 32,000 colonies could be doubled for six years in the United Kingdom, making 2,048,000 in all; but as the United States probably has not as many colonies as that, Mr. B.'s estimate seems too large. Nature has a delightful way of keeping things to an ordinary level. Mr. B. was so desirous of increasing the bees in Scotland that he regrets he has not \$5000 in cash to get a shipload of them from Dantzic, in Germany. He says he would rather take them 4000 miles by ship than 100 by land: but that was before railroads were built.

In speaking of the process by which bees rear a queen from a worker egg by floating it in royal jelly, Mr. Bonner treats the matter in such a way as to make it intensely interesting; but he seems to conclude from this, following Schirach,

that bees are quite independent of drones so far as brood is concerned. All through the ages there has been a disposition to throw a club at the drone simply because it does not and can not gather honey—as if life consists entirely of something to eat. Where nature always provides something, we may conclude that its absence would render the chain useless.

In the matter of candying, Mr. Bonner says that honey in even the same hive varies greatly, some candying immediately and others remaining liquid till December. The latter kinds have a slightly greenish tinge.

No reference to Huber is made in this book. This seems a little strange when we consider the fact that the fame of the blind Genevan had already gone around the world.

One of the most delightful things about these old books is the frequent glimpse one gets of life among what Abraham Lincoln called "the plain people." Now we find ourselves in the quaint kitchen beside the blazing hearth, melting wax; anon we are in the garden or flowery meadows, or on the rugged crag. With such books the past is still present, and old Father Time stops by the roadside while we read.

Medina, Sept., 23.

W. P. Root.

E. FRANCE'S REPORT.

INDIFFERENT WINTERING, BUT NEARLY TWENTY TONS OF EXTRACTED HONEY.

Such is the subject of an article which may be found in GLEANINGS for May 15, 1893, pages 388 and 389. At the close of that article, April 20, we were in the midst of a snowstorm. Now, I propose to give a report from that time on until the present. At that time I was in hopes of saving 400 colonies; but we dwindled down to 323 with queens, and about 20 queenless. Most of the queenless ones we built up into good colonies; but we had to draw so heavily from those having queens that it would have been better if we had thrown the queenless ones away.

We moved all the bees from the Whig yard, to fill up vacancies in the Adkinson and Gunlaugh yards, so now we have 6 yards instead of 7. Now, why did we have so much loss in the spring? You will see by my spring report, that, on April 20, we had snow and cold weather. At that time the queens all stopped laying; and, do all we could, we could not get those queens to laying again for three weeks; and the consequence was, when the clover commenced to bloom, all the bees were weak—few bees in a hive, and many of the hives with no live bees in them at all. We had a hard fight with fate to save as many as we did. We fed sugar syrup freely. If the syrup was put into feeders right over the bees, they would take it down; but there was no vim nor ambition about them. We tried to get the bees to work on the combs of the dead ones. No, they would not do it; open up the hives, set the combs out, there they would stand, with very few bees about them. When the dandelions opened out, then the bees woke up, and the queens went to laying rapidly. The bees spread out to cover the brood; and as the weather was warm they increased fast. Dandelion blossoms were very plentiful—the most I ever saw. We took brood from the strong to give the weak, so as to save as many queens as possible.

White clover commenced to bloom about the first of June; but the bees did not work on it until about the 18th of June. We commenced to extract June 19th. At that time the bees had picked up considerable dandelion honey; and as for losses of colonies, we were out on

solid ground, and could now count up the stock and see how many we had. Queenless ones we did not count, as the other colonies had to furnish bees for them until they could get a queen—in fact, until their own brood was hatching.

White clover this year was the best I ever saw. Pasture fields looked as white as a field of buckwheat. There was so much of it that the bees very nearly all worked within one mile of home; and our honey this year is the best grade we ever had, taking the crop all through.

YARD.	Col's in spring.		Amount, first extracting.		Amount, 2d extracting.		Amount, 3d extracting.		Amount, 4th extracting.		Amount, 5th extracting.		Totals for each yard.
	Date.	June.	Date.	June.	Date.	July.	Date.	July.	Date.	July.	Date.	July.	
Klebestine.....	33	19	895	26	737	1	663	8	975	17	224	3494	
Waters.....	30	19	1314	27	1500	3	1628	10	1840	18	710	6892	
Gaulauch.....	47	21	1123	28	1494	5	1328	11	1460	19	770	6375	
Cravin.....	55	32	1620	29	1471	6	1678	12	1420	20	600	6189	
Adkinson.....	56	33	1830	30	1600	7	1710	13	1750			5390	
Home.....	80		1755		3700		4080		1180		195	10910	
Total.....	323		7437		10502		11287		7625		2499	39150	

Drainings from cappings, etc., made 500 lbs., or a total extracted of 39,650 lbs. Besides the extracted honey, I am taking off third stories from the home yard; honey in the brood-combs, at least 3000 lbs., which we will keep for spring feeding, if we should want it. All the bees have plenty of honey for winter.

You will see that we commenced to extract the 19th of June, and quit the 20th of July; in fact, we extracted but very little after the 12th of July, except in the home yard. My son Newel had a set of hands. They worked the out-yards, and I had one boy with me and worked the home bees. There were two or three times that Newel and his help were home in time to help me with the home bees. One day they helped me two hours, and we extracted 1400 lbs. in that time. We did it with a two-frame non-reversible extractor. One hand did all the extracting. That was during the third extracting. The dates of extracting in the home yard are not given. I extracted more or less every working day while the season lasted.

White clover was unusually good; but the basswood did not amount to much; and since the basswood, there has been nothing for the bees to work on. Every thing is dried up. We have had only two little showers since we commenced to extract. It is now just four weeks to-day (Sept. 12) since we had any rain, and not much then. The white clover is badly killed out. It doesn't look as if we could get much honey next year. We did not increase our stock of bees very much. You see they were weak when we commenced, and the honey came in so rapidly that the bees kept the combs full of honey, leaving the queens a poor show to raise brood. However, we got a good working force all round, and got a few new colonies.

HOW FRANCE MANAGES THE MOTH-WORM.

We had all the empty combs we could use, to make new colonies and tier up on our L. hives at home. We have several hundred empty combs on hand now in our storeroom. They will be good for another year. We find empty combs are a great help. They are as good as cash in the bank. We had combs from 260 colonies that died last winter and spring—most of them in the spring. Some of them got wormy before I could get them into the storeroom. Those I had to melt up. But all that I got into the storeroom are free from worms now. Our storeroom for combs is 10 feet square, 8 feet high, lathed and plastered; one door and one window. There is a cellar under it. Down cellar I have a sheet-iron stove with a four-

inch pipe from the stove up through the floor into the room above. When I got the room about a third full I found that some of the combs were getting a few very small worms in them. I shut the door and burned half a pound of sulphur in the stove below. That ended all the worms. Then I kept filling in until the room was full of combs; then I smoked them again—burned a pound of sulphur. We used out about half of the combs. About the time we quit extracting I found the comb-room door open one morning, and there was a bee-moth on the window. I killed it and shut the door. After that I saw that the door was shut all the time except when it was opened to look in. I made it a point to look in every day. One morning when I looked in I found about 30 millers about the windows—great fat fellows. I killed all of them by dropping them into a pail of water, and then I set them out for the chickens. I was so busy that I did not smoke the room that day. The next morning there were more millers about the window than the day before. I just shut the door and let them alone, but went down cellar with one pound of sulphur—put it into the stove, and set it on fire, then went up and looked in the window. There they were, trying to get out—about 50 of them. They had a lively time of it for about five minutes, then they dropped down on the window-sill and floor, and there they are now—not so lively. The next day I found a bunch of combs, about 10 of them, all webbed together, full of cocoons and big worms, all dead. I took the bunch out of the comb-room, and put them into the shop. There they are now. It is now about three weeks since I smoked the room, and so far I don't find any worms or signs of them; but I shall smoke the room again in a day or two, for possibly some of those millers' eggs may hatch and make trouble. I have been putting in about 400 combs of honey, taken out of the third stories in the home yard. They may contain a few worms. I will give them a smoke, and make sure of them. But I have been in the habit of putting in combs in the fall every year for several years, and have not smoked them, and never had worms in them. But I am getting them in this year about two weeks earlier, and this hot weather I am a little afraid of them; so I will smoke them this year.

E. FRANCE

Platteville, Wis., Sept. 12.

CLOSE SPACING.

GETTING RID OF BURR AND BRACE COMBS BY WIDER TOP-BARS.

A correspondent writes: "After seeing what you say about space in Stray Straws, Aug. 15, I took the Hoffman frames out of a Dovetail hive and put in their place nine thick-top frames, and it seems to work like a charm. We winter here on summer stands, and seldom move the hive, hence I am disposed to do away with the division-board in order to have as much comb as possible, with a view to large swarms. Now, how do you think the nine frames will work? Would it be safe?"

In the straw referred to I raised the question whether it would not be well to have only one-fourth inch between top-bars: but in that I had no thought of changing the distance of combs from center to center. More fully expressed my idea was, "Why not make the top-bar an eighth of an inch wider, so as to make the space between top-bars $\frac{1}{4}$ instead of $\frac{3}{8}$ of an inch?" As my correspondent lives in Tennessee, there may be a difference between his

place and mine; but I should advise him to experiment on a somewhat small scale before settling on nine frames in an eight-frame Dovetail hive.

It is true, that the difference as to distance from center to center is not very great; but I am afraid that little difference is on the wrong side. Let us figure a little. The inside width of the hive is $12\frac{1}{2}$ inches. Divide that up for the 9 frames and 10 spaces, and you will find your 9 frames about 1.32 inches from center to center—only about $\frac{3}{8}$ of an inch closer than the $1\frac{3}{8}$ with the 8 frames—less difference than one would suppose; but then, you must remember that we have gained about an inch of space by throwing out the dummy. Without knowing any thing positive about it, I suspect that there is hardly any gain in spacing closer than $1\frac{3}{8}$, and it is possible that there may be some loss.

By throwing out the dummy, and letting the frames occupy all the space, you are obliged to give up fixed distances; for you couldn't get out a frame with nine at fixed distances, and must rely on crowding together to get the first frame out.

With nine frames you might do better, but I suspect the nine frames would better have full room, and I would have a larger hive for them.

SPACE BETWEEN TOP-BARS.

Now some words as to the real idea that was in that straw. The matter of getting rid of the sticky, dauby nuisance of burr and brace combs is one of very great importance—at least, it is with me. I can't say how it may be with others, but in my experience I am satisfied that a good many more bees are killed with brace-combs than with close-fitting Hoffman frames, shoulders and all—that is, before any brace-combs are built in the Hoffmans.

But I am obliged to say that, with the Hoffmans as sent out, there are too many brace-combs. So I have been doing some experimenting. One strong colony had frames with top-bars $\frac{7}{8}$ thick, and a space of $\frac{3}{8}$ between them. In this there were no brace-combs to speak of. But there may be a difference in colonies, and I think I have seen top-bars of the same thickness with occasional brace-combs.

Knowing that bees when left to themselves build out their combs of honey so as to leave a space of about a quarter of an inch between two surfaces of comb, I could see no reason why they should want any larger space between top-bars, and it seemed to me that a wider space than necessary was only inviting brace-combs. I had a number of frames with top-bars $\frac{7}{8}$ thick and an inch wide. These, when spaced $1\frac{3}{8}$ from center to center, left a space of $\frac{3}{8}$ between the top-bars. In order to reduce this space I nailed on the side of each top-bar a strip $\frac{1}{8}$ in thickness. The strips I had for this purpose measured $\frac{5}{8}$ in width, so that, when the frames were spaced $1\frac{3}{8}$ from center to center, the space between top-bars was $\frac{1}{4}$ of an inch for the upper $\frac{5}{8}$, and $\frac{3}{8}$ for the lower $\frac{5}{8}$. I did not think this so well as to have a uniform space of $\frac{1}{4}$ inch; but I happened to have just those strips, and for experimental purposes it turned out all the better.

In order to have the experiment as general as possible I distributed these frames in a number of hives, putting two frames in a place, the remaining frames in the hives being loose hanging frames with $\frac{3}{8}$ top-bars. The result was the same in each hive. The spaces between the old and new frames were promptly filled with a plentiful supply of brace-combs—of course, that was to be expected; but the space between the new top-bars showed in no case a brace-comb. Lifting out the combs, however, I found that, in most cases, the bees had built more or

less comb below the added strip. That is, in the lower $\frac{5}{8}$, where the space between top-bars was $\frac{3}{8}$, the bees had built more or less comb directly on that part of the top-bar where the strip was deficient. One might have supposed that they would have built brace-combs from one top-bar to the other, but they didn't. They merely put on a thickness of $\frac{1}{8}$ inch, leaving $\frac{1}{4}$ inch space clear.

I would rather have waited another year before giving the result of my experiment, and do not now give it as any thing positively conclusive; but as it is an important matter I should be glad to have others experiment and report. It is just possible that, with longer time and under other circumstances, the bees may conclude to fill up with wax or propolis that $\frac{1}{4}$ space. Yet the question comes back, Why should they, if that's the space they leave of their own accord? So I hope others will experiment and report.

C. C. MILLER.

Marengo, Ill.

[We should like to have a report from others in regard to the brace-comb question; and when we say "brace-combs" we mean those bits built between the top-bars. When we speak of burr-combs we mean those built between top-bars and cover or super. Now, we can widen the top-bars, as Dr. Miller suggests; but it narrows up still more the projections of the top end of the end-bars, so that there may be danger of their splitting off. These projections, or forks, as it were, are narrow enough already. Before the end of this year we hope there will be enough reports in so that we can decide intelligently.]

FIGS.

LITTLE OR NO HONEY FROM THOSE RAISED IN CALIFORNIA.

Editors Gleanings:—I have found the issue of GLEANINGS for the 15th of August a very interesting number. After reading it I am constrained to supplement some of the articles I saw therein, with the following observations:

The article "Do bees gather syrup from figs?" reminds me of that passage in the Bible where it says something about our not being able to gather figs from thistles. But as I can not draw any lesson between the two quotations, I will content myself by saying that here in California we grow the finest figs in the world. We have had them on our place for years. The trees grow very luxuriantly. We are opposite the Golden Gate—about some twelve miles from that strip of water which connects the finest harbor in the world with the great Pacific Ocean. The figs produce two crops of fruit a year. The first is now ripening; in fact, they have been gradually coming in for the past three weeks, and one crop will run into the other, so that we shall have ripe figs almost up to Christmas, if early frosts do not set in before that time.

Though several varieties are cultivated all through the State we have but one kind, and that is the black sort. These figs are large and luscious. When fully ripe they are the nicest fruit that I know of. It was only a few days ago that I learned of a new way of eating them. Heretofore the strawberry was my favorite fruit. I have changed my "taste" since; in fact, I think Isaak Walton, had he only lived at this time, and could sit down and eat figs in the way I am about to tell of, would, in all probability, move to amend that saying he made about the strawberry being the best of fruits. What I was going to say about eat-

ing figs to perfection is this: Select fine, ripe fruit; remove the skin; place on a saucer or dish, and cover with fresh cream. When eaten in this way there can be no richer or pleasanter dish served. It is said that the Japanese persimmon is called the "fruit of the gods;" but I am inclined to think that, if the Japs had learned to eat figs and cream they would never have raised the insipid persimmon to the exalted place they have otherwise seen fit to give it.

The fig is the easiest tree that we can grow, outside of the willow; in fact, it is as easy to propagate as the willow. All one has to do to get a fig-tree is to take a twig off a fig-tree and stick the end in the ground as he would a willow cutting, and it will spring up into a large tree almost before he has time to get his wits together. Right here I will tell a little story about the fig-tree in this State.

This tree, as well as a number of other fruit-trees that have made California famous horticulturally, was introduced here a century and more ago by the Franciscan friars, who founded 21 missions from San Diego to a point 50 miles north of San Francisco, for the conversion and civilization of the Indians. One day a party of Spaniards were traveling from one of these missions to a distant place in California. Before one of these men set out he cut a stick from a fig-tree to use as a whip to urge his *bronco* along faster. As the beast began to jog along nicely after a while without the aid of the rod, the rider got down from the animal's back and stuck the end of the fig-shoot into the soft earth, that it might become a tree. But he was greatly surprised, when he returned a few months later, to find that its growth had more than exceeded his expectations. He hoped to see a tree four or five feet high; but when he found that his whip was now a tree that could shelter himself and his beast, and he on the latter's back, he was thoroughly astonished. It was one of the wonders of the new land which, not a great many years later, were proclaimed the world over.

The Old Mission figs have given place to the newer and better varieties from Europe and Asia. Thousands of acres of figs are planted in some counties of this State. They are sent to market in their ripe state, they being sent to the Eastern States during the past few years. Then the greater portion of the crop is dried. Some of these are put up in nice boxes so as to tempt the lover of dried figs; then some, and, I think, the greater part of the product of our fig-orchards, is sacked and sent to market. To my liking, this is not an inviting way to place them before customers. Figs in this shape are apt to become wormy. Then, of late years, the fruit is made into confections; and, again, it is used to a large extent, I have heard, for making medical preparations.

But it was the relation of this fruit to the bees that caused me to begin these lines. Though we have had figs on our place for a score of years, I never saw a bee at work upon the ripe fruit. There is always more or less broken fruit on the trees, as the birds are very fond of figs; and if they are not gathered as soon as they show signs of ripening, the birds will begin to depredate upon them. Then, when they get fully ripe, the skin breaks, thereby giving the bees plenty of opportunity to feast upon the juice of the fruit. Still, I have not the least doubt that where bees are short of food they will go to the ripe figs and gather the rich syrup.

In the city of Sacramento, this State, where this tree is growing in many streets as a sidewalk-tree, one may see the sidewalk all covered with the ripe fruit in the fall. In walking along some of the streets of the capital city, a

person has to be careful where he steps; for, if he should place his foot on a ripe fig, his fall will be as sure and swift as if he had trodden upon a banana-peel. At both Sacramento and Stockton, the latter city being some fifty miles south of the former, and in the great San Joaquin Valley, while the other is in the celebrated Sacramento Valley, the fruit is never gathered for the market. It is simply left for whoever wishes to help himself. I suppose this is mainly owing to the fact that the fruit is of the common variety, and also because there is so much of it that, if it were put on the fruit-stalls, no one would purchase it, as there is so much to be had everywhere in the city.

Last year, while visiting the great wine and raisin vineyards in the vicinity of Fresno, 207 miles south of San Francisco, in the San Joaquin Valley, I saw some fig-orchards of the white variety, which must have covered several hundred acres. This section is the greatest in the world for drying fruit. Every thing is dried by the sun in the open air. Here is located the largest raisin vineyard in the world. It is over 600 acres in extent.

There is one more thing that I should have said about the fig, and that is this: They make the nicest preserves that one could well wish to eat. At our house we have them prepared in pretty much the same way that peaches are put up in sweet pickle. I have never seen them anywhere where I have been, in this way. It seems to me that, if housekeepers and, in fact, canning companies, knew how to put them up in this way they would do so, for there is no finer and more palatable dessert than pickled figs.

W. A. PRYAL.

North Temescal, Cal., Aug. 28.

Concluded next issue.

HEADS OF GRAIN

FROM DIFFERENT FIELDS.

HOW TO CLEAN PROPOLIS FROM SECTIONS; J. E. CRANE'S WAY.

The best way to remove it from boxes, to my mind, is to first keep it in a hot room and let it ripen with the honey; then with a sharp knife in the right hand, made of the best stuff, and holding the section in the left hand, you can clean faster than with any thing to lay the section on. A good worker can clean 1000 sections a day.

J. E. CRANE.

Middlebury, Vt., Sept. 12.

HASTY'S STATISTICS VERIFIED.

I never saw so many queens as this year from a second swarm. I shut the entrance of one hive with queen-excluding zinc, and I removed it a week after, and I found 7 dead queens behind it. Some hatched as late as the 17th day from the issuing of the first swarm. My experience is the same as E. E. Hasty's. I have had a good many swarms issue 14 days after the first one.

I tried one Langdon non-swarming device; bees swarmed in two hours after I turned them into the other hive; then after 7 days I shut them up again 7 days to prevent a second swarm, and they became queenless. The others swarmed one morning at 6 o'clock.

Columbus, Wis. SUPER LIFTER.

SECOND SWARMS ON THE EIGHTH DAY.

I see that G. M. Doolittle handles his second swarms on the same principle that I do, only I let my second swarm come out and cluster, then cut out the queen-cells, and then run them

back. I have not had them swarm again the same season. I have practiced this plan for three years, also for others. I always look for second swarms on the eighth day, weather permitting. I have had them swarm on the seventh, never after the fifteenth day.

Lisbon, Me., Sept. 11. BENJ. MERRILL.

SCRAPING SECTIONS; USING FANNING-MILL SCREENS.

You ask for a device on which to scrape sections. I arrange a rather long low table, just high enough to clear my lap when seated at it in a chair. For a rest for sections I use a couple of fanning-mill sieves with half or three-fourths inch mesh. On one sieve at my left I turn the case of sections upside down and slip the case off, and they are easily separated. On the other sieve I rest sections and scrape them. I think it pays me well to save the separators if they are not too much eaten away. I scrape them only where they come in contact with the sections. The bees are not nearly so apt to build brace-combs to the glazed surface of an old separator as to a clean new one. They are also less inclined to curl, and are cheaper than new.

W. C. SIMONS.

Arlington, Pa., Sept. 4.

THE LANGDON DEVICE NOT A NON-SWARMER, BUT A SWARMER; IN THE ROLE OF THE LATTER, A SUCCESS.

Friend Root:—You call for reports with regard to the Langdon non-swarmers. I have used it this season, and with me it has proved a success. I think, however, that it does interfere with brood-rearing. It was predicted last spring that this device would bring about great changes in the apiary, and I think it will. But in my opinion its real value lies in its being used as a *swarmer* and not as a non-swarmers. Next year I expect to use it for that purpose. When a colony begins to look like swarming I will set an empty hive by their side, into which I will place a few frames from the colony, including the queen, and then put on the device and send the field bees into the new hive. Then I will remove the device, set the new hive on the old stand, and give the old colony a queen or a queen-cell, if they need it. I think the above plan will work, for this year's experience has proved that field bees can be run into another hive.

C. H. SHERWOOD.

Newton, N. J., Sept. 12.

HOW TO MAKE A MODIFICATION OF THE PORTER BEE-ESCAPE.

After reading the article in the Aug. 15th GLEANINGS, page 648, on bee-escapes, the idea struck me that I could improve on our English cousin's method. I took a $\frac{3}{4}$ -inch board, 16x21 inches, and with a $1\frac{1}{2}$ -inch auger I bored half way through from the under side, finishing with an inch auger. I then cut a channel, as described in GLEANINGS, but cutting on one side of the hole. The channel is $\frac{3}{8}$ inch wide and one inch long, cut sloping. The wire screen was cut a little longer than the hole, say $2\frac{1}{2}$ inches long, and then the wire was unraveled for half an inch on one end, leaving the points of wire half an inch long. These were all bent back except the four center wires which fit in the channel and allow the bees to pass under, but do not allow them to return. I have three of those boards at work in my apiary, along with the Porter escapes, and they do the work fully as well. The boards that I use have two holes, or escapes, but I think that one hole would do the work as well as a Porter escape. Make one and try it, and see how cheap an escape can be made. It costs practically nothing.

Our honey crop is poor this year. The drouth spoiled it.

W. S. FULTZ.

Muscataine, Iowa, Aug. 31.

There is a general complaint, of dull times. All farm products are ruinously cheap; and, though our honey is also cheap, the bee-men are about as well off, and I think a little better, than the producers in other industries.

Redlands, Cal., Aug. 4.

RAMBLER.

FAITH IN GOD CONTRASTED WITH UNBELIEF.

Since the time when I thought best to permit some of the friends to express in GLEANINGS their unbelief, there has been a sort of ringing in my ears and a hungering in my heart, that these poor mistaken brothers might see how awfully cruel it is to take the stand they do in their antagonism to the gospel as revealed in the Bible. Just now a little Christian tract comes floating through the mails into my hands. As I looked it over and caught the inspiration from the pure loving spirit it unfolds, I wondered, "Will not this little story touch some heart, and lead it out of the darkness of unbelief into the light of faith in God?"

THE CAMP MISSION.

Let us glance at a typical lumber-camp. Through a lumber-road in a deep forest we come to three long, narrow shanties of logs—one for horses, mules, and oxen, and the other two for men; the sleeping-building filled with hard bunks; the dining-building having a long table set with tin dishes, piled with coarse food. A blast from a tin horn brings from twenty-five to one hundred men in heavy mackinaw or toboggan suits. The men are known as "shanty boys," and some are only boys in years, while some old loggers have spent nearly all the winters of their life in camp; but the majority are strong young men in their prime, mostly rough hard fellows from everywhere, of nearly all nationalities. Some whole camps are French, German, or Norwegian, but usually they are a mixed lot, representing sometimes half a dozen countries.

This great army of woodsmen, equipped with axes and saws, and stationed here and there throughout the great forests, are numbered by the hundred thousand. They fell the timber for the churches of the land, but are banished by their work far beyond the sound of church-bells. They provide the material for the homes of the nation, but are themselves outside of home comforts and saving influence, only as they are reached by camp evangelists. No congregations receive gospel messengers more gladly. No camp-meetings in the world have such results as these winter camp-meetings, where swearing men have become praying men; where gospel hymns have taken the place of vilest songs. Almost every camp has good singers. A hymn has brought up old memories, leading to lasting good. Whole camps have been changed. One Sabbath a camp-meeting was held where the Sabbath before there had been a drunken carousal, and men had been chased out of the camp by drunken companions with axes. Strangely, murder had not been the result, and one week brought a great change. Oh if we only could reach more of the multitude of camps! We have been able to send out only a few of the many evangelists needed for this gospel work in the forest. Yet, as the result, hundreds of lumbermen have been brought to God, and there has been untold good that we can never know until the recording angel unfolds the eternal history.

In a work like this, shall we lack money? Only 5 cents will buy a New Testament, and 3 cents a gospel song book with a hundred familiar hymns; and only 1 cent will buy twenty gospel cards, all of which have been blessed in the saving of souls. It is strange how easily rough hearts are sometimes reached. Testaments are read in camps sometimes by hardened men who would not look at the little book at home. A gospel hymn rings through a camp, and is caught up by other voices and awakens tender chords, recalling holy memories that seemed buried for ever. A gospel card or tract is slipped into the pocket, and read some lonely hour to call a homesick soul to God and heaven.

How far this gospel work shall reach into the

dark pineries and into the lives of hardened men depends on the amount of help received. Showers of fragment dimes and nickels and pennies would bring "showers of blessings."

Can you help our winter camp-meetings?

In his name,

EMMA C. NASON.

Blodgett Mills, N. Y.

Chairman of the Lumbermen's and Miners' Mission of the King's Daughters and Sons.

REPORTS ENCOURAGING.

I can report 22,000 lbs. of extracted honey from my 110 colonies the past season.

Riverside, Cal., Aug. 19. H. E. WILDER.

The honey crop in this section is the largest we have had in some years—white clover mostly. My 45 colonies gave 1500 lbs. comb honey, 500 lbs. extracted. It is dry now and they are at a standstill.

CHESTER BELDING.

Middletown, N. Y., Aug. 12.

I see in GLEANINGS some very bad reports from our State, so I will report my success, which I think is good. I had 13 colonies, spring count, and got 764 lbs. of comb honey (white clover and alsike), mostly in 1-lb. sections. I increased to 27 colonies, and went through the hives 8 days after swarming, and cut out queen-cells, but got an after-swarm from one hive, as I must have missed a queen-cell in it. Bees rested through August, but have been doing a land-office business on smartweed, that grows on low land. All my honey last year was from smartweed, and I got 47 lbs. per colony surplus from that source. I use the 8-frame Dove-tailed hive.

J. W. COOK.

Poneto, Ind., Sept. 13.

OURSELVES AND OUR NEIGHBORS.

Charity vaunteth not itself; is not puffed up; doth not behave itself unseemly.—I. COR. 13:4, 5.

In order to explain what brought the subject of my talk to-day vividly before my mind, I wish to say that our good friend Terry, in replying to many of the letters he gets, is in the habit of copying portions of them into the *Practical Farmer*. In the issue for Sept. 16 he writes as follows:

Only one sentence in friend Austin's letter troubles me. He says: "Mr. Terry, in a late article in the *P. F.*, does not give the name of the farmer who wrote him about potato-bugs, very considerably, thinking he had just laid him out." May God take away the strength from my right hand when I use my experience with the pen to simply "lay out" a brother-farmer whose practices are different from mine; and may he help me to always try to show friends in a simple and kindly way how it seems to me they can improve.

Now, I do not know that, among all of friend Terry's utterances, there is any thing that has pleased me so much as the point made in the above. In newspaper controversy (and we have a good deal of it) it has long been a custom for the readers to take sides with different prominent writers, and to set them on, by counsel and encouragement, as it were, in order that they may get the upper hand, or demolish one another. The strife or contest seems to be like a couple of boys wrestling. Each bends all his energies to get the other down under, while he keeps above him. In a newspaper contest the aim of each party seems to be to show how smart he is, how much experience he has had,

what great crops he has grown, and how able a teacher he may be compared with the other. Then the friends on either side will send in encouraging epistles of congratulations—"Didn't you lay him out most beautifully?" etc. The matter has been brought prominently before my mind in my recent replies to friend Dadant. Several would say, "Brother Root, you can not tell how much it pleased us to have you lay out Dadant so beautifully." Now please notice that some of the friends on the other side have said, at just about the same time, "Brother Root, I rather think that Dadant laid you out pretty well in your discussion. Why, you didn't even answer him at all." Perhaps they meant these communications as kind and friendly, but yet they gave me pain. I surely did not want to "lay out" friend Dadant, and I do not think he wanted to lay me out; yet in spite of our good intentions the thing got quite a start in the way of laying each other out. I judge so because of the great number of communications that came in on both sides, and by the urgent requests that are made to have me publish more on the subject. I am sure, however, it is not best. I have seen this thing go on and on through different periodicals for months, and it has always grown worse. The good editor several times protested and urged both parties to give up, but they persisted so strongly on having just one more reply, to make it even on both sides, or to set themselves right before the public, that the editor would reluctantly give way, hoping there would be a better time to stop it further on. But the better time never came. If permitted to go on, all rules of courtesy were soon violated, hard words came out, and personal and private matters were pretty soon pushed out before the world in a way that must be painful to every one who had not become ensnared in the strife. Our text tells us that true Christian charity, or love, "vaunteth not itself" (the margin says, "or is not rash"); "is not puffed up; doth not behave itself unseemly;" that is, if we have the rule of love in our hearts for our fellow-men (or, what amounts to the same thing, the spirit shown by Christ Jesus when he was here on earth), we shall not want to get *above* anybody nor *ahead* of him; we shall not *want* the best of the bargain; we shall not even wish to have the world know how smart we are; and we *surely* shall have no desire to become *millionaires* at the expense of keeping thousands in poverty.

I suppose likely friend Terry reads these Home Papers of mine—at least, a good part of them. Now, I wish he would stop reading right here, and skip on, say, till the next page. I say this because I am afraid that what I have to say will give him pain. I do not believe that his wife and children will particularly object to what I say, and so they can read on; but even at the risk of giving him pain I want to speak of and comment upon the spirit he has shown—at least in the greater part of his newspaper writings. Friend Terry is just now one of the brightest and most able agricultural writers we have in the world. His articles are picked out and read first; his books are having a run that few books of a similar character have ever had. And now perhaps I am saying something that I hardly ought to say, for we are the publishers of all his books but one. There are thousands of writers for the agricultural papers who would give almost any thing if they could write like friend Terry, or in as able and helpful a way as he does. What is the secret of it? Why, it seems to me the great secret lies in the fact that what he says in that newspaper extract I have made is literally true. He has no desire in his heart to

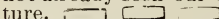
"lay out" or silence any other newspaper writer or any other brother-farmer. He has at times been abused and misused; he has been *shamefully* treated, not only in print but in public. I was present at one farmers' institute where he was sent for, and where they paid him for coming and teaching; but even there this disposition I speak of came up so strongly that he was publicly insulted, almost at the outset. I do not know that they intended it as such, but there had been a great deal of outside talk and fault-finding. A good many indulged in saying that they did not believe he had ever done what he claimed; and in his first talk, or, rather, answers to questions, he did not take time enough to make full explanations, therefore somebody thought he saw a place to get even Terry himself into a corner, or, in other words, to catch him in an untruth; and, even though our friend was an invited guest, this critic did not hesitate publicly to accuse him of misstatements. Now, friend Terry has abundance of opportunities to retaliate. He is a strong man physically, mentally, and morally. He could, if he chose, "lay out" the biggest part of us in a physical contest, or in a contest with intellect; and perhaps if we were boasting of our *good clean lives*, he might, if he chose, show a better record than most of us there. Yet I have never seen him take any advantage of this sort. His honest desire seems to be to help everybody up a little higher, and never, by any means, push anybody down or hurt his feelings.

I do not know where this expression "lay out" came from. In our prizefighting (oh how it pains me to say our prizefighting!) I believe the contestants do their utmost to lay each other out if they can. I have never witnessed such a sight, and I am quite certain I never shall, and so perhaps I am wrong; but my impression is, that, when one can deal the other such a blow that he lies stunned and still, he is said to be "laid out." I do not know what the crowd does on such occasions. Perhaps they cheer the victor, and gather round him to shake hands because God happened to give him more muscle and skill than he gave to the other fellow who lies helpless and still. Now, in newspaper controversies where one writer can so effectually use up the other that he quits writing, and does not appear any more in print, I suppose he may be said to be "laid out;" or if his opponent can go away back and rake up some disgraceful episode in the other's life, they lay him out in that way; and then the crowd or the readers laugh and shake hands over it. Is this Christianlike? Is it even gentlemanly? Sometimes we hear it urged in extenuation, "But just look, will you? at what he wrote about me." Well, this sort of reasoning would do very well were this not a Christian nation; and were it not that every civilized individual assents to the injunction, "Return *good* for evil, and *do good* to those who hate you," Terry says, "May God take away the strength from my right hand when I use my experience with the pen to simply lay out a brother-farmer whose practices are different from mine." The contest, it seems, was about potato-bugs. Terry preaches and practices hand-picking the mother-bugs before they lay any eggs or raise any brood. One bug in April means a *host* in June. Quite a number of very successful potato-growers do not like this plan. They think it is too much pains and fuss; and when friend Terry has, at the different institutes, very modestly given his way of doing, there have been some rude and almost unkind replies. However, after he has given the *full* particulars of his plan, they usually look at it a little differently. But even where unkind and harsh speeches

have been made, my heart has been rejoiced to hear him reply so gently, and in a way that makes it so evident that he never lays up any thing.

On one occasion, some individual at an institute where W. I. Chamberlain was speaker would have it that friend C. had a *grudge* against him for something that happened at some previous meeting; and friend C. could hardly convince this man that he did not even remember the circumstance; and even if he did, he would by no manner of means have cherished any ill feelings because of it. Prof. Cook once made the remark, that this life is too short, and there are other things of too much greater importance for us to indulge in grudges, even if we feel tempted at times to do so; and I believe this is the spirit of the age.

As a rule, the speakers at our institutes are men of enlarged views and generous feelings; if it were not so they would not be employed by the different States in these important positions. The great busy world oftentimes does not seem to be able to comprehend that they have no time nor disposition to take up little things, or feel hurt at trifles.

Last week one of the clerks told me that a man below was very anxious to see me. He apologized for taking me from my work, but said he was about to change his location, and wanted advice relative to the change. He was a grower of small fruits, and lived several miles from market. He had found a piece of land in a brisk little town, at only \$100 an acre. Should he pay that price rather than give \$30.00 or \$40.00 an acre for equally good land three or four miles from market? He wanted to grow strawberry-plants as well as berries, and it was quite necessary for him to be near the post-office. After asking me quite a number of questions I told him I thought it would pay him to go into town. Then I asked him if he had not already seen our book on strawberry culture. 

"You mean one that was written by Terry?"

"Yes, by Terry; the latter part of it by myself. We call it *our* book because we are the publishers."

"I don't want any thing to do with Terry or his books."

I was astonished at his reply, and said, "Why, my good friend, what should induce you to speak in that way? Have you ever visited his place?"

He replied that he had not, although Terry's home was hardly more than twenty miles from where he lived.

"Have you ever heard Mr. Terry speak at an institute?"

Again he replied that he had not, but gave as a reason for his position that he did not believe Terry had ever accomplished any such results as he claimed; and what do you think was the ground for his want of faith? It was something like this:

"Now, look here, Mr. Root, if Terry ever raised any such amount of extra strawberries, on clover sod, as he tells about, why in the world doesn't he plant his whole farm to strawberries, and make a big thing out of it?"

He evidently seemed to think he had got a clincher on me this time. I replied:

"Before we go any further, my good friend, I want to tell you that there are a *few* men in this world who are not working solely to make money, and who have no ambition to make a "big thing," especially if the big thing would be apt to bring a load of care, and interfere with other things of far *greater* importance than simply getting money."

I presume that, when he received my reply, he thought what I was saying was kind o' put

on—that may be I was a religious crank, or something of that sort. There are so many people who seem ready to sacrifice a quiet home, and rest and peace, for the sake of making a big thing, that I do not know but that others will feel as did this friend, that my talk about other things being of more importance than making money was something put on for effect. But there is a sad moral right here. The man who, in his anxiety to make a big thing, would sacrifice his home, make his wife a drudge, and let his children go without an education, in order that he may get rich, does not, as a rule, get rich after all. He wrecks his own happiness and that of those who should be near and dear to him, and becomes bankrupt in the end.*

The Bible tells us, "Whosoever will save his life shall lose it"—that is, he who makes his sole anxiety the accumulation of property and money, and in so doing neglects to make things pleasant and easy for his wife, and to look out for the education of his children—in short, to attend to the higher and graver responsibilities—shall surely lose even that which he works so hard for; but, on the contrary, the one who is willing to lose his life for better and higher purposes shall find after all that he has made the very shortest cut toward the thing he especially coveted.

Now, in this connection let us consider this matter of spending one's time and energies in the pursuit of what this world has to offer—or in ministering to self and selfish demands. Jesus said, "Not to be ministered unto, but to minister." Below is a clipping in regard to a man who spent his life in ministering to self. It is taken from the *Christian Standard*, of Cincinnati:

A methodical man died in Berlin recently at the age of 73. When 18 years old he began keeping a record which he continued for 52 years, which is the best commentary we have seen on the life of a mere worldling. His life was not consecrated to a high ideal. The book shows that, in 52 years, this "natural man" had smoked 62,871 cigars, of which he had received 43,692 as presents, while for the remainder he had paid several thousand dollars. In 52 years, according to his book-keeping, he had drunk 27,786 glasses of beer and 36,086 glasses of spirits, for all of which he spent \$534. The diary closes with these words: "I have tried all things, I have seen many, I have accomplished nothing." A stronger sermon could not be preached than to put this testimony against that of the first missionary: "I have fought a good fight, I have finished my course, I have kept my faith; henceforth there is laid up for me a crown of righteousness, which the Lord, the righteous Judge, shall give me at that day."

No wonder his decision was, at the end, "I have accomplished nothing." But he is not alone. We see illustrations in this line all around us. Perhaps we have been ourselves doing the same thing more or less. How this little story brings out in sharp relief the pure,

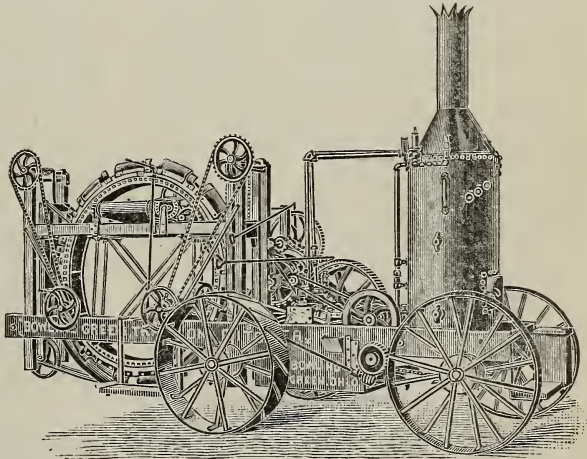
*I want to pause right here long enough to say the man went away without buying the strawberry book after all. I spent about half an hour of my valuable time with him; yet all he wanted to know was told a great deal better in that strawberry book than I could possibly tell it. And the book also took in the outside matters that must be considered in accepting the advice I gave him; and yet he was not willing to pay 35 cts. for it. Please do not think that I feel hard toward him. I am quite willing to do as much whenever I can help anybody; but if he is going to raise strawberries and strawberry-plants for a living, he is the loser. I feel sorry that he should stand in his own light.

unselfish life of Saint Paul! Yes, we have also the example of such lives right around us, in our very midst—perhaps in our next-door neighbor. These, however, are so quiet and unassuming that the great world seldom notices them particularly, unless some unexpected incident brings it to the front, and lets people have a glimpse of the unselfish lives they are living. Who shall finally inherit the earth? Not those who have ministered unto themselves; but the meek, the lowly, the humble, and the unselfish. "Blessed are the meek, for they shall inherit the earth."

NOTES OF TRAVEL.

ON THE WHEEL.

You will remember that, in our last, I started to see that steam-ditcher. In our book on tile drainage, page 79, friend Chamberlain says: "Such stones, in such numbers as they usually occur on boulder clays that need drainage, make machine digging at any time of the year unprofitable." As soon as I got in sight of the machine I was most pleasantly astonished by seeing rows of ditches so straight and true that it seemed almost as if it must be some fine piece of mechanical work instead of such ditch-diggers as we usually dig by hand for laying tile. The dirt was piled up in a beautiful, straight, true, sharp ridge, just near enough the ditch so it did not tumble back into it, and the machine was puffing and blowing and traveling along at a rate that was really astounding to



A MACHINE FOR DIGGING DITCHES FOR LAYING TILE.

my inexperienced eyes. It was my great pleasure to find the inventor and builder, Mr. James B. Hill, of Bowling Green, O., there at the time running the machine himself. Before we go any further I want to tell what it looks like.

The special feature of Mr. Hill's invention is the large wheel at the left hand. This wheel is peculiar in that it has neither shaft nor spokes. In fact, it is just a big stout ring of metal, made of plates of malleable iron securely bolted together. There are teeth along the inside edge of this great wheel, and a stout gear-wheel works in these teeth. Thus you observe the enormous power needed is applied at the rim of the wheel. In fact, no shaft nor spokes would stand the tremendous strain. Well, this big wheel is quickly raised or lowered by turn-

ing the proper crank-wheels. The operator stands near this large wheel, near the side of the ditch. His position is where you see the various levers center for pulling and pushing. Of course, I soon began to talk, and ask questions. Mr. Hill is an enthusiast on his invention, as you may suppose. I think he has been at work at it for something like 15 years. He commenced in the ditch, digging ditches by hand, and has slowly worked out the machine he was handling. In a little time he began to look me over, perhaps wondering whether it was worth his time to stop work and bother with me. My good friend Green said something to him, I could not quite understand, as the machine made such a racket; but I noticed all at once Mr. Hill was very courteous and obliging. In fact, he seemed to forget all about his machine, and it was going ahead of itself; but he did not seem to care very much, any way. I was just wicked enough to wish it might run against a stone, to see him fly around and take care of it. Sure enough, in a minute more every time that big wheel came around it began to make the most unearthly shrieking and grunting and groaning—enough to frighten one. I was thinking about running, for fear the machine would go to pieces with a crash, and that the boiler would blow up, or something else direful would happen; but the inventor stood his ground and let the thing have quite a tussle with a stone. It made me think of a father who watches his sturdy boy while he is having a contest with a colt or some other unruly animal. After much sweating and puffing the machine actually scooped the stone out, dumped it on the broad rubber belt that carries away the dirt, and carried it outside on the dirt-pile. Then on it went again. Pretty soon another stone was struck; but this one was so large I feared the machine would actually crawl out of the ditch in its frantic efforts to go ahead in spite of the stone. Said I, "Why, Mr. Hill, it will surely tear those steel cutters all to pieces if you do not do something to help it out."

"Well, suppose it does break a cutter or two. In that wagon over there I have a whole load of repairs. If a cutter gets broken in running against a stone, it is only a minute's work to put in a new one, and so with every thing that is likely to break in the whole machine. The broken part can be taken out and a new one put in its place so quickly and easily that breakdowns are of very little consequence."

Here is another great point in the invention of this machine. The inventor takes into account that different parts must get broken; therefore each part is interchangeable, and the pieces of the whole machine are mostly small. They are made of malleable iron and cast steel, and all the cutters are kept on hand in the wagon, tempered and sharp, ready to take the place of any that become dull or broken.

After a while we got along where there were not so many stones, and friend Hill turned on the steam until the thing fairly hummed. Why, it was almost like plowing a furrow $2\frac{1}{2}$ or 3 feet deep. The sides of the ditch were beautifully true and accurate, and in the bottom was a little round channel for laying the tile. If a stone of any size is encountered, that big wheel is raised until it scrapes it all around. The operator makes the cutters scrape hard enough so as to cut into the stone if it is not altogether too hard to be cut by steel tools. If too hard, the big wheel simply goes over it down on the other side, and then goes on its way. Stones that can not be taken out by the machine must be either broken to pieces or the tiles laid around the stones, as described in "Tile Drainage." There was not very much hand work,

however, to do in the field where I saw it working. The ground was upland, and clay land at that, with the average number of boulders scattered along. The ground was already the proper grade along the surface, so no lines were stretched. It cuts to any depth not exceeding $4\frac{1}{2}$ feet. It cuts from ten to twenty rods per hour, and I believe the price paid by the Experiment Station was 15 cts. per rod for 30 inches deep. This is just half what I paid for hand work. It requires only a five-horse-power engine. The steel cutters that do the work are furnished at the factory at a cost of less than a cent apiece; and this one fact, it seems to me, is the crowning feature of the invention. For the work that a steam-ditcher must be called on to do, the cutting tools must become dull very rapidly, or get broken; therefore provision is made for replacing them, as I have told you. The apparatus weighs about $2\frac{1}{2}$ tons, and the price is \$1000. Mr. Hill has already built seven machines. The one I saw him working with was No. 7; and I tell you it was worth more than—shall I say a circus?—to see the man who built it operate it, and hear him talk, and answer questions. When I told him I was going to describe it in our journal he seemed greatly pleased, and offered to pay me what was right and fair; but I told him I was running around the country on my wheel, hunting up things that were interesting and valuable, and that in that line of work I did not take any pay.

After we saw the steam-ditcher I found there were some nice springs at the bases of the great hills on the experiment farm; and as you know one who rides a wheel is always thirsty, I took great delight in visiting the springs.

I had read in some of the papers friend Green's plan of training tomatoes on stakes, said stakes being of common lath driven into the ground, supported at the upper ends by stout galvanized wire. This galvanized wire is stretched the whole length of the field, being held firmly by stout posts well braced at each end. I remembered of thinking, when I read it, that these posts and wires and lath stakes would be quite a little trouble; but I did not realize what a handsome plantation or vineyard, if it might be so called, could be made with this arrangement. Why, that tomato-garden was one of the prettiest sights I ever saw in horticulture. The large fine fruit was just then ripening. It was up off from the ground, and the rows were, of course, as straight as a string could be stretched, for that stout wire held them straight and true, and the whole thing was so pretty that the people for miles around were coming there to buy the tomatoes as fast as they were ripe enough to pick. He said the fruit and vegetable dealers of Wooster had objected to the Experiment Station putting their products on the market; but there was not any need, for the people came after the stuff as fast as it was ready. The trial-grounds for the different kinds of tomatoes were on the same plan, but on a smaller scale; and I assure you it was a sight to see all the different kinds that have been talked about and advertised in the catalogues there in full bearing. Of course, the dry weather had affected their work more or less, especially as they have not yet got sufficient water at their command for their various experiments in irrigation.

Somewhere about this juncture friend Green said he was sure supper must be nearly ready. Said I, "Why, friend Green, your wife has been sick with a fever, as I have been told, and I fear you are not in shape to entertain company."

He assured me, however, she was able to be around, and especially wanted to see me.

"But a man down town told me you were moving into a new house. When folks move into new houses they do not want to entertain company, even if they are old friends."

To this he replied that Mrs. Green would be disappointed if I didn't come, for he had managed to send her word that I would be there for supper. I wonder whether I shall be telling stories out of school if I tell you confidentially that Mrs. Green was once in my employ. I remember of telling Mrs. Root what a splendid girl we had in one special department. She seemed to gather by intuition what needed to be done. Besides that, she accomplished almost double what even smart women do. Mrs. Root then volunteered to tell me a secret. She said she had heard it whispered that this nice girl expected to get married soon, and probably it was this fact that lent her energy. Now, didn't I tell you, a long time ago, that getting married always gives any man or woman more energy and enthusiasm, and of more value in the world? Yes, and this kind of energy holds out too. Another thing you may not believe; but there are lots of grand good people in this world who once served an apprenticeship at the Home of the Honey-bees. Not all of them have professors for husbands, but as a rule they are filling important positions *somewhere*.

After having had my accustomed nap, and a nice supper, I was urged to stay all night, as a matter of course; but, to tell the truth, I was longing to get hold of that wheel once more, and use my muscles in making it spin over the hills along the river-banks and across the country. Oh! hold on a bit. While we were partaking of that most excellent supper, I ate so heartily that I did not know but I should have to apologize a little to the assembled company. Thereupon I rested a little while. I remarked, "Friend Green, didn't you ask me, when I first came, if I had been to dinner?"

He nodded.

"Well, I told you I had been to dinner, didn't I?"

Then I told the story of my dinner of pretzels and sardines; and, didn't we have a laugh all around?

HIGH-PRESSURE GARDENING.

BY A. I. ROOT.

RASPBERRIES FOR HONEY AND FOR BERRIES.

HOW TO GET GOOD CROPS WITHOUT VERY MUCH OUTLAY OF LABOR AND MANURE.

Mr. Editor:—I am interested in Mr. Gleanings from beginning to end. As I am somewhat of a gardener I like the talks about high-pressure gardening very much. He says so much about strawberries I have often wondered why he doesn't touch on raspberries. I think they would certainly go better with bees, for the honey they would get would add considerably to the profit of raising them. I have a small patch, and the bees are at work on them from the time the first blossom appears until the last berry is picked; that is, they will eat the berries if there is nothing else for them to work upon. But this year the sumac kept in bloom until we were nearly through picking, so there was but little trouble compared to what there usually is.

I had about 17 square rods of ground occupied

by raspberries this summer, and I sold over \$23 worth of berries besides what we used. I got from 15 to 18 cents per quart for them—15 when I sold to be sold again, and 18 cts. at retail. I should have had a little more, perhaps \$25 worth, if it had not been for the dry weather and bees eating them. Yes, the bees do eat raspberries if the berries get very ripe, and do considerable damage even if I do not like to confess it. You see, if I raise \$25 worth on 17 rods of ground I should raise \$215, or a little more, on an acre if the conditions were the same. Is not this about as good as you can do with strawberries? Then there is not as much expense in their culture. Mine have been set out about five years now; and after hoeing the first year and some the second I have not touched a hoe to them, and I don't expect to for years to come. I cut mine back, and cut out the old ones every summer after they have done bearing. I then mulch them with leaves, old swamp hay, or any thing that does not contain seed that might germinate and cause them to become weedy. The best of any thing is the bedding that is taken out from under the horses, as this will fertilize them about right. But if you do not have bedding they should be fertilized with manure of some kind. The object of mulching is to keep down the weeds and prevent the canes from drying up. It will not prevent them from being winter-killed unless you cover to nearly the top of the vines.

The better way, if you want to keep them from being winter-killed, is to wait until the first snow, then fill between the plants on top of the snow, which will prevent them from thawing and freezing (which causes them to die). Cut paths about two feet wide lengthwise of the patch, and about four feet apart, so as to keep them in rows and make it convenient in picking. You should fill these paths with plenty of straw, which is needed to keep the grass down and the ground from becoming trodden down too hard.

The bearing plants should not stand any closer than three feet. Cut off the tops while growing, so as to cause them to branch and harden. The young shoots will be the ones that will bear the next season. No more of these should be left standing than what is needed for fruit, unless you should want to sell some. The plants could be sold at a profit among your neighbors at 50 cts. per dozen.

I know that there is more than one good way of doing the same thing; but this way, so far as I have given it a trial, suits to a dot.

Pomfret Landing, Ct., Aug. 31. J. L. HYDE.

[Friend H., raspberries are already quite extensively raised by bee-keepers; and if I could manage as you do, and still get good crops, I do not know but I should grow them more extensively. I recently saw a statement that friend Terry had not had a hoe nor cultivator among his raspberries, blackberries, or currants for the last three years. I have visited his patch many times, but did not know that it was so long since he had done any cultivating. The only drawback is the expense of straw sufficient to keep down the weeds, and keep the soil damp; and as we have lately purchased some damaged straw for only \$4.00 a ton, delivered, I began to think it would be the cheapest way to manage them. We used large quantities of stable manure, but most of that we purchase contains a fearful amount of seed. I suppose it comes from the weeds in the hay that the horses pull over into their bedding. Where some sort of mulch can be bought at a low price, it seems to me this will be the cheapest way to manage raspberries, blackberries, currants, and perhaps gooseberries.] A. I. R.

MUSHROOMS—HOW TO TELL THE GOOD ONES FROM THE POISONOUS, ETC.

A SEASONABLE COMMUNICATION.

For several years past, at about this season of the year I have noticed an abundance of mushrooms or toadstools in the pastures about here, especially among the pine-trees. The cattle seem to consider them a great luxury. I have but one cow, and I have watched her gather them by the hour. Now, it seems to me that, if these had been toadstools, the cow would have been poisoned past recovery. What is your opinion about it? Only this week I saw in the *New York Tribune* an account of a family poisoned by eating a mess of mushrooms in which was found to have been cooked but a single toadstool. Now, it seems to me that, if toadstools are so extremely poisonous, these that my cow makes a business of eating each season must be mushrooms. What is your opinion? How can I be sure which they are? The old woman's test was, to eat them; and if you lived they were mushrooms; and if you died, they were toadstools. I should like a sure test, but still a different one. Would it not be well for you to give an antidote for toadstool poison?

N. LUMAN GERRISH.

Nottingham Center, N. H., Sept. 16.

[Friend G., if mushrooms are in your locality so plentiful that the cows are eating them up, you ought to have a bonanza. They are found in most city markets from 50 cts. to a dollar a quart. Even those that grow wild are usually sold for about half as much. There is no doubt that those you mention are the edible mushrooms. At certain times during the present dry weather they have been quite plentiful, even around here; but they must be gathered promptly or else they become wormy. I do not know what the customary rules are for detecting the poisonous from the other: but the old woman's remedy is all straight, only you must not eat *enough* to kill you. Have your wife cook some, and take one taste and set the dish away. If no unpleasant symptoms follow, the next meal you can eat more, and after that eat heartily of them if you choose. In this way the scientists experiment to determine whether the new varieties are fit for food. Now, my description of the edible kind would be: First, they are, when fresh, pink on the under side. Toadstools are white all over, and especially on the under side. The edible kind has a pleasant smell, as if it were good to eat. When they first burst out of the ground they are pink on the under side; but if they are not gathered until the sides open out so the top is nearly flat, then the under side becomes black. These black ones are just as good for food, but they are very apt to become wormy. On breaking them open, if you see the worms have hatched out don't use them. When the edible kind first break the ground they are round like little balls, with a hole in one side where the stem is attached. These young ones are very nice, but it is a waste to take them when they are so small. I presume much of the danger comes by letting children, or somebody who is careless, mix in the white toadstools. A careful person should gather them, and then the cook should carefully examine them. When you are out in the woods, and have not any dinner with you, you can make a very nice dinner of mushrooms—that is, if you can find them. Just build a fire in some safe place where you won't burn up property. When you have got a bed of coals, just set your mushrooms on them, with the hollow or open side up. As soon as they begin to cook, this cup will become full of a

rich juice. If you have a little salt along, sprinkle it in this juice and it will make a delicious gravy for the mushrooms. It seems too bad that so much really valuable food should go to waste simply because of the ignorance of the people in regard to its value. We consider them fully as good as oysters, and they are the best substitute for meat of any vegetable that grows. We shall have to depend on some of the doctors who read GLEANINGS, for a remedy. I do not see how people can be poisoned unless they eat very freely of the poisonous kind; and I would advise all who wish to learn to eat mushrooms, to eat sparingly at first. If you are sure they agree with you, eat more, and so on. As to whether the poisonous kind would hurt a cow, I can not answer; but I hardly think a cow would eat toadstools. It would take a good many more to poison a cow; and perhaps what would be poison to us would not be so to so large an animal. I once fixed some Indian meal and arsenic to kill rats. The cow got at the dish and ate it all up with much evident satisfaction. In great fright I consulted our family physician; but he told me it wouldn't hurt her, and it didn't.]

LIMA BEANS, STRAWBERRIES, ETC.

Dear Bro. Root:—In "High-pressure Gardening" in GLEANINGS for Sept. 1 you speak of "all kinds of lima beans standing drouth and yielding a fair crop." I planted several rows of pole limas in good ground, well fertilized with wood ashes. They grew rank, and blossomed profusely, but didn't yield a tenth of a crop. Burpee's bush limas did some better. They had no wood ashes. Bush beans planted on the west side of my stable, shaded the early part of the day, planted in ground enriched by rotten manure, but not with wood ashes, yielded enormously. Were the ashes the cause of failure?

I have a seedling strawberry that sprang up in the garden, that had leaves on 4 inches wide and $4\frac{1}{2}$ inches long. I have the Sharpless and Crescent strawberry-plants. But this seedling has stood better in the hill, borne larger leaves, and is supporting more plants (over 30) from runners than any strawberry plant on the place. It blossomed profusely but bore no fruit; so, as it is quite secluded from other plants I set out, it must be pistillate. I intend to try it another year to see what it is worth.

I have three hives of Italian bees. I had to feed them for winter. Not content with that, they pitched on to a weak colony of a neighbor's and took its honey, then began on five of his other stands. His were black bees. I told him to close up his hives to half an inch, but it was no use; his bees wouldn't fight. So, to save my neighbor's apiary I sent my bees to a friend two miles in the country to winter, and that ended the robbing.

REV. W. E. DEAN.

Tunnelton, W. Va., Sept. 2.

[Friend D., I hardly think it was the wood ashes that prevented your pole limas from bearing. It might be, however, that it was. Our lima beans always bear. I do not know that we ever had the ground too rich for them unless it was when I tried to raise them down on the creek bottom. They grew there, but they did not bear any beans of any account; while upon our clay hills, where the ground is heavily manured, we always get heavy yields. Your bush beans were probably a variety that always yields any way. Was not your new strawberry-plant on very rich ground? It seems to me it is a little strange that it does not bear at all. Even if this late variety bears imperfect berries, if you get it to bear fruit we shall be very glad to hear further from it.]

ONION SEED THAT IS NOT USED—WHAT SHALL WE DO WITH IT?

Of course, it is pretty well understood that onion seed is not safe to sow more than one season. Sometimes it grows pretty fairly, but it is so important many times that a good stand be secured without thinning out, that we wish to know exactly how much seed to put in, or as nearly as may be. I do not know what is usually done with the old onion seed, but I think I have heard of burning it up. Some seedsmen asked, through the papers, whether it would be safe to feed it to horses. Well, I will tell you what you can do with it, and not wrong anybody. Use it for raising onion-plants; then sell your plants, or plant them out, and you can have just as perfect a stand, or more perfect, for that matter, than the most perfect seed-drill can give. The nicest bunch onions in the world can be produced by sowing your onion seed in the latter part of the summer or during the fall, depending upon where you live, and the severity of the winters. If you can winter them over they will make a much finer onion for bunch onions than the winter or Egyptian onion. Let them get just as large as they will without shooting up to seed. Watch closely; and just as soon as you see one making toward sending up a seed-stalk, "yank 'im out." This is some trouble, but it utilizes all your crop, and those that do not run up to seed at all will make large handsome onions far in advance of seed sown in the spring. My opinion is, that the White Potato onions and the White Multipliers are going to be a great acquisition right in this line. They will furnish us fine bunch onions very early, and it is claimed that they never send up any seed-stalks at all.

THAT HOME-GROWN PEDIGREE ONION-SEED.

I do not know whether the above is the right name for it or not; but what I mean is, the onion seed that I raised from those great big Spanish onions that I found in the Cleveland market. Let me see. I paid about \$2.00 for the dozen or so large onions that I planted to get the seed. I picked out the very biggest, and some of them weighed about 2 lbs. apiece. Then I got only about 2 ounces of seed. So you see the onions for the seed cost something like \$1.00 an ounce; and put the labor at 25 cts. an ounce more, and my seed cost me toward \$20.00 per lb. Never mind if it did. I wanted to know whether the seed would be any better than that to be found in the hands of seedsmen. Well, after all my pains and trouble I came *very near* slipping up on it. The ground was so wet in the spring that we didn't get any onion ground in just the shape I wanted it for these expensive plants until quite late; then the severe drouth set in suddenly; and at present writing we haven't any onions much larger than a hen's egg. Part of them we watered; but I kept thinking it was going to rain; and I am sure now that they were not watered enough. So you see my experiment apparently amounted to nothing. But, just wait. There is a sequel to this. One of my friends came along a few days ago in his buggy, with his wife. Said he:

"Mr. Root, when shall we pull those great big onions? Will they stop growing of themselves, or shall we have to break the tops down?"

"What onions do you mean?" said I.

"Why, we bought the plants of you. I think you call them Prizetaker."

One of the boys who stood by me suggested that they had let this man have a few of my choice onion-plants; but when he came again, and wanted some more to fill out a row, they told him that I had forbidden them selling any more to anybody. You may be sure my

countenance brightened up, and I walked toward the buggy quite brisk and smart. We happened to have some Spanish onions, bought in the Cleveland market, on the stand near by, and I picked up a couple as I walked toward the buggy. Said I:

"Why, let them grow, by all means. If our season is long enough they will get to be like these."

As I held them up I expected to astonish my friends in the buggy; but Mrs. H. replied:

"Why, Mr. Root, we have got them almost if not quite as large as those in your hand, already, and they are still growing rank and green; and what we want to know is, when they are going to stop and when they must be gathered."

As soon as I could spare the time I jumped on to my wheel and went over to their place lively. After I had looked at the two rows of onions I said:

"Why, neighbor H., suppose you had an acre like these—what would they be worth this season?"

His wife, however, replied:

"Mr. Root, I am very glad indeed we haven't got an acre like those, especially if I were obliged to carry water for them as I have been doing."

Then it transpired that she had carried water by hand, and watered those two rows of onions nearly every night all through the drouth: and, besides, somebody told them the dirt would have to be pulled away from the bulbs as soon as they began swelling. This they had done, and kept the ground cultivated nice and clean, and there were two rows of Spanish onions like those that are now quoted in the market at \$1.40 a crate, or about 5 cts. per lb.; and thousands of people pay this enormous price, or often 10 cts. for a single onion, just because they are showy and handsome, and keep hard and solid and dry almost the whole year round.

Now, I have not any seed like that to offer you. I do not know that there is any in the world. I can raise some more, however, by planting some big onions next spring. One thing I do know; and that is, I never had any onion seed, and never saw any, that would produce a crop of all nice big onions, almost exactly alike, as these have done. Another thing, there is not a red onion nor a white one, nor any sort of hybrid or mongrel, in the whole crop. We went right home and cultivated and watered ours, and are going to push them; but I fear it is now (Sept. 14) almost too late.

TO GET GOOD ONION SEED, AND SOMETHING ABOUT WHITE MULTIPLIERS.

Mr. Root:—We got some Prizetaker onion seed of you last spring, planted and cultivated *a la* "Joseph," and made fine large bulbs; but your seed is mixed. We have been trying to "keep up with the procession" in the onion business, and know from cultivating the improved sorts, that, among that lot, we found Prizetaker, Red Rocca, Yellow Rocca, Maule, White Silver King, and one other sort we are not acquainted with. We prefer Prizetaker because it does not rot so badly here as other big sorts. No harm done here, however.

ABOUT WHITE MULTIPLIERS.

You are partly wrong. They are a standard sort here, and have been for 20 years or more. To note their points in order named by yourself, they never send up seed-stalks, hence no tough ones. The yield we find to be equal to any, under good treatment. They make the *pounds*. You are wrong about the little onion growing all season and making "a big one." The true White Multiplier carries within itself the embryo *cluster*, which it will be sure to

develop without failure. Cut the dry onion in two midway between root and stem; and if you do not see the future *cluster* clearly outlined in the one bulb, your seed is mixed or some other kind. If true, you can count the chickens *before* hatching as well as after. You can tell just how many onions you will have next season — i. e., in numbers. When we want to make them grow larger we plant on better ground and cultivate better. To make still larger, pull out part of each cluster. I will send a few by mail of the kind I am talking about. They were raised on poor ground, and crowded for sets. We grow them by the quantity. This onion does not rot.

D. D. FORMAN.

Slatonville, Ark., Aug. 28, 1893.

[Thanks for your kind criticism, friend F. I believe it is customary for seedsmen to excuse themselves for sending out such onion seed as you mention, by saying that the new varieties are greatly inclined to sport, and also to run back to the original variety; and the fact that other people have had red onions and white onions when they planted Pritzetaker seed, no matter where the seed was bought, may lend countenance to this way of getting out of it. But the Pritzetaker seed that I mention in this issue, raised from Spanish onions bought in market, gave us onions all alike in color, shape, and in every other way. There is not a red onion or a white onion — not a single one — to be seen anywhere among them. From this and other similar experiences, I am satisfied that it is possible to have onion seed true to name. Where seedsmen get it raised by the ton, however, I am afraid we are not likely to get that kind. It can not be afforded at the price the seed is offered. Then comes the question, "If we buy seed of somebody who asks a good deal bigger price, shall we get it then?" I have paid as high as \$6.00 per lb. for Pritzetaker onion seed; but I am sorry to say it was not a bit better than some that cost less than half as much. I am greatly interested in those potato onions. The few you sent me by mail are exactly as you say. In the middle of each onion is a division line, so that we can really count our chickens before they are hatched. It is not clear to me even yet, however, how you manage to get big onions and little onions. White Multipliers I have raised seem to grow in a sort of haphazard way. Some of them seem to split up into a multitude, and others grew just one or two big ones. If you have a strain of White Multipliers that yields well, it is just what we are after.]

ONION-SETS, ETC., ONCE MORE.

You know, a year ago we had quite a controversy about onion-sets. I said they were too big, and would all go to seed, etc. Well, a good many went to seed too. Last spring I got another bushel of sets, which I thought a good deal better; but on account of the drought at least 90 per cent went to seed; but it happened that I did not have quite enough to fill my patch, so I went to a store and got two quarts to fill out with, and they were the nicest sets I have seen—a good deal smaller than yours, and not one sprouted. They were planted on the same ground, the same day, and had the same culture as yours; but I am sure not over 10 per cent went to seed. They made beautiful onions, only a little later than yours. They came from L. L. Myer & Co., St. Paul, Minn. This made me think about the boy in your employ who had procured some onion seed from the West, and raised such nice sets that you gave him so much for them that you sold them without a margin, for the mere fun

of sending out nice sets. This brings me to the belief that the western-grown seed is better than the eastern for us.

About the American Pearl. I got a quart last fall. They grew immensely; but how disappointed I was to find, with most of them, from 5 to 10 little onion-sets. They must have been "running" with Potato onions, like an old box-hive keeper's queens with my Italian drones. Said he, "Mr. J., since you have kept bees here my bees change color. Is it possible that your drones run with my queens?" Well, I think they must, and so with the onions. They are mixing in. JULIUS JOHANNSEN.

Port Clinton, O., Sept. 18, 1893.

[Friend J., I do not know but some of the friends will think that this is an "onion" number. The sets you speak of came from Landreth, and he says he raises them and ships them by the carload, and that no one but you and me have any trouble. Now, with the big prices they charge us—five and six dollars a bushel—it does seem to me as though we might have better sets. The boy who raised such fine ones for us last season has mostly failed this year on account of drouth. If paying high prices would be the means of getting something extra we should feel better about it. But the boy bought seed that was a great deal cheaper than our own, and then beat us all to pieces in raising sets. I have never noticed the American Pearl doing as badly as you state. Although a great many of ours have split up into two or three onions instead of one, there would usually be one pretty good-sized onion, and the others small. I wonder whether anybody else has had the same experience with the American Pearl sets. We are just now waiting for a rain so we can plant a big lot of them.]

A HOME-MADE GREENHOUSE.

Under the heading of "High-pressure Gardening" I have been very much pleased to learn in many ways about new plants and new ways to garden, so as to have early vegetables, and nice ones. We had never had any experience with greenhouses until we built one. Then there was a new building, and also a new work to run it; but, to tell the truth, the greenhouse nearly ran itself; and, aside from watering the beds to keep it moist, the plants grew *themselves*, and we looked on with joy; and I must say that we never raised as nice radish and lettuce as in the greenhouse. It beat outdoor gardening in quantity and quality. Now, I think that it is or was owing a great deal to the way we heated it. Our greenhouse is 10x30 ft. on the ground, with double roof, all glass, board side up to plate of building, and sheeted with paper between sheeting and siding. For our furnace we took common hard red brick and made it 20 inches by 24, grate surface. In order to get very fine grates I made the pattern of them and had them cast here at the Ballston iron-foundry. I think a set of grates cost a little over a dollar. We covered the smoke, or gas and smoke, all around the greenhouse, in under the beds through a common 6-in. glazed tile, which gave a part of the heating surface. There is another thing. I took a 1½-in. steam-pipe and went to the blacksmith shop and had it bent. The furnace was at the entrance of the greenhouse, and at the other end was a barrel with one head taken out, and stood on end, top open, filled about half full of water; and this coiled or bent pipe is placed in the top of the furnace, and with another straight pipe coupled on, and going to the barrel of water; and from the other side of the barrel more straight pipe back to the coil or furnace; and, in fact, back to both coil and furnace. Now,

you see both ends of the pipe go in opposite sides of the barrel. Steam goes through one, and water comes back to the furnace and coil always, when the end of the pipe is covered with water; so if you fill the barrel one-half or two-thirds full of water once in 24 hours, all is well, and water will boil in the barrel if all works right. One great advantage is, this barrel of hot steaming water holds the heat, even when the fire is very low; and, the top of the barrel being open, gives steam or vapor circulating around in the air among the plants, which furnishes moisture, and things grow finely, and of a beautiful dark-green color.

Now, this barrel of ours was a kerosene-oil barrel, and cost 50 cts. We took out one head and put some straw in the barrel and set fire to it and let it burn till it began to char a little, then tipped it upside down. It will smother out. Now, these 6-inch tile will crack, about half of them, as they start from the furnace; but take a wagonload of old broken brick, or some that are not broken, and some common mortar, and bed and cover the tile with brick and mortar, and you have a safe thing against fire, and a good heat-retainer. We never set up a night to keep fire with this arrangement, and yet never froze our stuff in the greenhouse; and in weather 20° below zero, although the fire would be quite low in the furnace, the mortar and brick, and hot water, steam, and all, kept things all right.

This arrangement will work in any kind of a greenhouse. Of course, I could tell you much better and easier than I can write, how to arrange to get good draft, etc. There are two good things about this way of heating greenhouses. First, it is the cheapest way that one can heat, and the best, I think, unless one goes to the great expense of steam-boilers. I have seen some of the greenhouses which are heated by steam-boilers, and, as nearly as I can get at the amount of coal they burn to the square foot, we beat it our way. It does not cost ten dollars a year for fuel to run the 10x30-foot greenhouse. One reason we have the furnace grates very fine, or close together, is that, when the weather is mild, we can use quite a lot of coal dust, which you can buy here for 50 cts. a ton, and sometimes the coal-dealers will give it to you to have it drawn out of the way; and with the fine grates there are no cinders in the ashes. All fine ashes fall through. When you rake out the grates, in this barrel at the further end of the greenhouse you can at any time dip out hot water and put it with cold to have it as you wish for watering beds or any other purposes you may need warm water for. We had two faucets in the pipe, running from the furnace to the barrel—one at the furnace and one at the barrel, so we could draw water at either place without carrying it. The bottom of the barrel should stand a little higher than the coil of pipe in the furnace, so that the water can run from the barrel to the furnace.

WM. H. GRAY.

Ballston Spa, N. Y., Aug. 23.

GARDENING IN OCTOBER.

We have just been having a most beautiful rain, and it rained long and slow, so as to soak into the ground very thoroughly. The soil now works most beautifully, and it really seems as if it had been greatly benefited by the long severe drouth; and the turnips, cabbage, strawberries, onion-plants, and especially the celery, are just booming. I never saw things grow faster. About the first of October, almost every season something seems to give me a wonderful enthusiasm for making things grow. When the leaves are falling and so many things are dying,

it is just delightful to see hardy plants like wheat, rye, spinach, turnips, etc., come up and grow as if they knew their lives depended upon getting in every inch of growth possible before winter. Then how delightful it is to stir the mellow soil and give such plants encouragement when the air is so cool and invigorating! And, by the way, it begins to be pretty well settled, I believe, that celery grown on upland, or in rich gardens, is nicer and of better flavor than that from the swamp and muck lands. We have been purchasing celery from the swamps almost all summer, on account of the drouth; but just now we have some most splendid White Plume of our own raising.

Now, then, what can we plant, and what gardening can we do in October? Well, you can sow rye, anywhere and everywhere, just as fast as a crop is gathered, or as soon as the frost kills tender crops. You can put out winter onions if you have not done it already. I do not know of any other things that may be sown in October, in the open ground; but, of course, you can put out radish, lettuce, etc., to be covered with glass when frosts come. Small fruits and fruit-trees, grapevines, etc., may, of course, all be planted in October; but as a rule, I believe my experience would be in favor of spring planting unless it is strawberries; and perhaps you had better not put out strawberries in October unless you know from past experience that you can make it succeed. We are going to put out many thousand during the present month of October, and we do not expect to lose one in a hundred—oftentimes less than one in a thousand. I know many others succeed in fall planting, because we are having considerable orders right along every day. Yesterday we had a telegram for 1000 Jessies.

One reason why I love the strawberry-plant is because it is so exceedingly hardy, and you can cultivate it and make it grow. You can manure it and make it throw out runners, not only throughout October, but even in November; and strawberries often make considerable growth with us in December. No matter how much you push them, the sudden advent of severe freezing does not seem to hurt them a bit. The only thing to be guarded against is to keep the frost from heaving them out by the roots; but even if the frost does heave them out, it does not seem to kill them; for if you go over them in the spring, and put them back down in the ground, they will grow almost as well as if they had not been clear out on top for quite a spell. In fact, you can work for strawberries, and make garden, almost every month in the year. If you have some choice variety like the Timbrell, that you wish to push "for all it is worth," by putting them in rich beds and covering them with sash when the weather is severe you can make them keep growing and extending their roots almost every month in the year.

TRADE NOTES.

McINTYRE'S NEW EIGHT-COMB HONEY-EXTRACTOR.

ONE THAT RUNS BY WATER POWER, AND REVERSES IN FULL MOTION BY CENTRIFUGAL FORCE.

On page 626 of GLEANINGS for 1890, Mr. McIntyre described an automatic reversible honey-extractor, one that would reverse under full motion. At that time he had not tested the idea, but he seemed to be very confident that it

would work. Since then he has put it into practical application, and describes it as follows: the upper end of this shaft is a 4-inch iron wheel with a 2-inch face. A band of iron 2

This extractor was built last spring, and has extracted 41,000 lbs. of honey, reversing in full motion without injury to the combs or machine. We found it quite a saving of time to be able to reverse the eight baskets in one instant by simply raising the lever shown above the machine; but I do not think it would amount to very much with a small machine, as they are so easy to stop and start. I built this machine largely to show my faith in the principle; but when I found that it worked so well I was almost tempted to get it patented.

The engraving shows the inside gear connected with the water-motor. The water is turned on and off by raising and lowering the large lever at the right. The motor makes about 550 revolutions per minute, and the speed is geared down 3 to 1. The center-shaft is $1\frac{1}{2}$ -inch cold-rolled steel shafting, with a ball bearing at the lower end, and a babbited box near the upper end. On

the upper end of this shaft is a 4-inch iron wheel with a 2-inch face. A band of iron 2 inches wide and $\frac{1}{8}$ thick, with a piece of thick leather riveted on the side next the wheel, fastened at one end, and passing almost around the wheel, and terminating in a piece of $\frac{3}{8}$ gas-pipe about 2 feet long makes a splendid brake.

The hubs which support the arms are cast iron, and the arms are screwed into them. The arms are $\frac{3}{8}$ gas-pipe, $\frac{3}{8}$ outside. A gas-pipe T, with a flange cast on each side to fasten the heavy wire braces to, furnishes the bearing for the axle of the baskets. This basket-axle is $\frac{3}{8}$ round iron, and the baskets are fastened to it by means of a malleable casting that runs around the top and bottom of the baskets, and is held in place by a set-screw. The edges of the baskets are No. 22 galvanized iron, with a flange turned over the ends of the folded tin braces that support the wire cloth. Near the lower end of each basket-axle is a 5-inch sprocket-wheel fastened with a set-screw. A

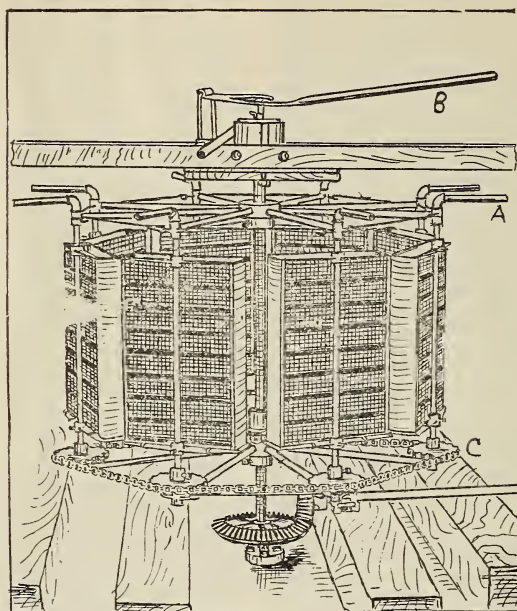


FIG. 1.

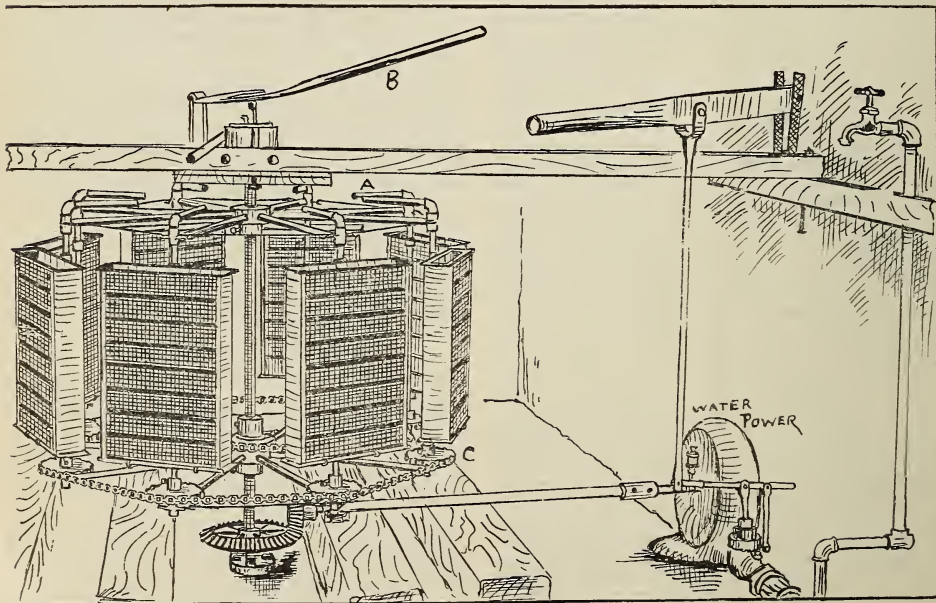


FIG. 2.—M'INTYRE'S AUTOMATIC REVERSIBLE EXTRACTOR.

steel sprocket-chain passes around these wheels, and also around a 5-inch wheel on the center-axle when the baskets are turned; i. e., the center-wheel is locked by a key which runs up the center-axle, and connects with the lever above. When we think the first side is extracted clean, this lever is raised, which draws the key and liberates this center sprocket-wheel, when all the baskets whip around to the outside of their own axle as quick as a wink. The combs do not let go of the wire cloth instantly, consequently much of the honey is out before the combs jump to the outside of the basket.

The outside, or, rather, the last side extracted, is not bruised a fourth as much as the first side extracted. The little levers on the upper end of the basket-axes are to turn the baskets in before starting. This is done with the left hand while the right hand is raising the water-lever. A machine built on this principle should be strong and well made, and will require a larger can than the Stanley. A four-comb machine requires a can about as large as a six-comb Stanley. The can should also have a rim around the top, extending in about four inches to prevent any thick honey from flying out of the can.

Since the honey season closed I have spent a whole day experimenting on centrifugal force. I can run my extractor at any desired speed by turning on more or less water, and I had a splendid opportunity to test this force at different rates of speed and at different distances from the center. I took a piece of lead weighing exactly 1 lb., and attached it to a spring balance fixed to register in beeswax the number of pounds which it drew out, which would show exactly the number of times centrifugal was greater than the force of gravity. I tried it at four different distances from the center, 12, 15, 18, and 21 inches, and at four rates of speed at each distance; namely, 120, 140, 160, and 190 revolutions. The following table shows the result:

No. of rev. per min.	Diam. of circle in inches.	No. of lbs. centrifugal force.
120	24	5
120	30	6
120	36	7½
120	42	9
140	24	7
140	30	8½
140	36	10
140	42	12
160	24	9
160	30	11
160	36	13
160	42	15
190	24	12
190	30	15
190	36	18
190	42	21

Estimating a comb-basket to weigh 3 lbs., and a comb with one side full of honey at 3 lbs. more, we have 6 lbs. for each basket. With eight baskets revolving 18 inches from the center at 190 revolutions, we have $6 \times 8 \times 18 = 864$ lbs. centrifugal force on the baskets, and combs half full of honey. Can you not see how impractical it would be to turn a set of combs in full motion against this force? It would take the strength of a horse to turn four combs.

One interesting thing about this table is the fact that, with the machine running at 190 revolutions per minute, the centrifugal force increased one pound for every inch the weight was moved from the center-axle.

Before closing I will say that this extractor cost me over \$50.00, and I don't know how many days' work. The reservoir and pipe cost me over \$100, and the motor \$50.00. Now don't write me to know where they are made, and how much the various sizes cost. They are not manufactured at present at any price. I

am not in the business, and the only way I know of for you to get one is to make it yourself, or persuade A. I. Root or some other manufacturer to make one for you.

Fillmore, Cal., Aug 29. J. F. MCINTYRE.

[The reader will readily understand the principle on which the extractor reverses at full motion by referring to the engravings. The baskets are pivoted in such a way that, when the honey is thrown out of the combs on the first side, it is nearer the center-shaft by two inches or so than when the honey is thrown out from the other side. The baskets themselves, being pivoted on one side, when turned as shown in Fig. 1 will fly outward, as shown in Fig. 2, unless held by something. Well, that something holds the baskets until the honey is extracted from that one side. Then it releases them and allows them to present the other surfaces of the comb.]

There is no doubt in our mind but this is a most practical device for reversing under full motion. It is practical, because it has been thoroughly and carefully tried; and for those who have a large lot of extracting, probably such a machine would be the most serviceable; and yet, after all, the hand machines will extract a tremendous amount of honey. Said one of our extracted-honey men one day, while we were talking about extractors, "I can extract more honey with one of my small machines than I or any three or four bee-keepers can raise." But Mr. McIntyre can easily say that it is not a question how *much* you can extract, but how much you can extract *with the least labor and expense*. If any of the large extracted-honey men would like an extractor of this kind we would undertake to make one; but at present we are not in position to say just what the cost would be.]

In another column, "Rambler" speaks of the great difference between the comb-foundation mills we first made and those we are now making. We do not wonder that the difference was discovered; for the fact is, another mechanic is now making the mills. They are now made under the direct supervision of Mr. A. Washburn, the one who made the first successful roller comb-foundation mill.

WE have had unusual success in sending queens by mail this year, not only to points in the United States, but even to the more distant ones across the great oceans—to Australia, Sandwich Islands, and elsewhere. We attribute our success entirely to our present method of making the Scholtz (or what is more commonly called the Good) candy. In the early part of the season we were experimenting with candies of a different nature altogether—some having a slight amount of the white of an egg, some with glycerine, and some with other ingredients calculated to keep candy soft; but after having tested all of these it is the same experience all over again—that the Good candy, when *properly made*, is far ahead of any thing else. But why our unusual success with this candy over the same candy used in previous years? Simply in having a good strong man to knead it for a couple of hours. Heretofore a woman has mixed the sugar and honey, and kneaded it into a good stiff dough; but we always discovered that, sooner or later, this candy would vary under different conditions. A good strong man with brawny muscles now handles the chunks of dough, and kneads it continuously with all the strength he can bring to bear for a couple of hours. When thus treated, the candy will remain soft and moist in hot, moderate, and cool weather; and it

seems to make but little difference whether the atmosphere is dry or moist. After having lost pretty heavily in experimenting with candies other than the sugar and honey of the *Good* old sort, we have decided to "stay where we are at," and let *Good* enough alone.

In midwinter you may find some colonies short of stores, and the only way to pull them through is to give them a lump of candy; or it may be well to have a stock on hand, ready for an emergency.



Whosoever shall exalt himself shall be abased; and he that shall humble himself shall be exalted.—MATT. 23: 12.

SAY, Rambler, the idea of crossing lightning-bugs with bees is older than the hills.

In our last issue we expressed a doubt as to whether the fall flow of honey would amount to much throughout the North; but so far reports in our own locality, as well as those in many others, show that the fall flow of honey will be pretty fair in spite of the prevailing drouth.

WE have had several inquiries as to how many there would be in attendance at the big convention in Chicago, from the Home of the Honey-bees. Both of the editors of *GLEANINGS* expect to be there, accompanied by their better halves. The latter, however, do not promise to be present at all of the meetings, because they say the World's Fair has greater attractions.

WE find it necessary for us to say again, as we have often said before, that articles from small bee-keepers are just as acceptable as those from bee-keepers who number their colonies by the several hundred. It is not the numerical strength of an apiary that decides whether the owner's articles shall be used, but the value of the article itself. Other things being equal, the owner of a large apiary is more experienced than one who has a small number of colonies.

WE have just been down looking over the progeny of the extra yellow queens of the five-banded stock obtained from Mrs. Jennie Atchley. These queens were placed in the apiary of our neighbor, Mr. Vernon Burt, who, as you may know, is testing for us bees, devices, etc. Well, the bees are very yellow and quite industrious, and our friend Burt seems to think they are a little bit ahead of the ordinary stock. We have protested against this tendency on the part of queen-breeders to running to yellow stock; but when the facts show that industry as well as beauty are combined together, we protest no longer. It begins to look now as if the American Italian queens would excel any other queens of this race in the world.

WE extend our grateful acknowledgements to the *Bee-keepers' Review* and the *American Bee Journal* for the pleasant things said of our co-worker and friend, W. P. Rort, regarding those book reviews he has been writing up of late. We knew all along that these reviews would be appreciated; and when we came into possession of that gold-mine of old books it occurred to us that our friend would be just the right person to look them over. This he

has not only done, but read nearly every thing in them. Those of our readers who have not read the reviews would do well to go back to the June 1st number and read them clear through. The writer's excellent knowledge of the times in which they were written enables him to make these reviews doubly interesting. By the way, the last paragraph in the review for this issue is exceedingly well put. Some of the domestic scenes referred to remind one of the "Cotter's Saturday Night."

QUIET robbing, as spoken of on page 687, has been a great boon to our apiary. Usually, during the month of September there has been very little egg-laying; and this is just the time we want brood-rearing to be doing its best. Barring good protection and good stores there is nothing that insures successful wintering more than a lot of young bees raised in the early fall. Well, this quiet robbing has stimulated our whole apiary to brood-rearing. Queens have been reared, and eggs have been laid during the month just past just about as we find it in the height of the honey-flow, when every thing is booming at its best; and the result is, we shall have a large force of young bees and young queens. It should not be forgotten, however, that young queens are far better fall layers than old ones; and this will account in part for the egg-laying.

VARIOUS methods are now being proposed for scraping propolis off the sections. This is all proper in its place, and is just what we called for; but it may be well to suggest that much scraping may be avoided by using the right kind of surplus appliances. When sections are put into section-holders or shallow wide frames with wide wooden separators placed between, separators wide enough to cover up entirely the perpendicular edges of the sections, and the whole keyed up, very little scraping will have to be done. The surplus arrangement of the Dove-tailed hive—not that we want to boom that particular hive in this department—was made along these lines, after having carefully examined the surplus arrangements of prominent bee-keepers, right in their own workshops. When the sections are keyed up tight it closes up the interstices between the sections and the separators; and the tighter these are closed up, the less propolis will be chinked in; in fact, when the crop is stored rapidly, little or no scraping will be necessary when the sections are placed in the arrangement we have described above.

ONE of our correspondents, Mr. John B. Mason, of Tasmania, calls our attention to an experiment that was performed by Sir John Lubbock and Professor Darwin for the purpose of showing for what particular color, if any, the bees have a preference. "The experiment," he writes, "was performed by spreading on a white cloth small squares of variously colored glass, with a dab of honey in the center. The bees were found to always crowd on to the blue." Our correspondent goes on to state that, if blue is the favorite color of the bees, a flag at conventions can be displayed as an emblem of the industry. It can be made of "blue bunting, with a bee in relief, having gold thread for bars, and an old-time straw skep in gold." If the bees do show a decided preference for blue, such an emblem would be very pretty and appropriate; but from some very casual observations with hives of variously colored fronts, we could not discover that the bees showed any particular preference. As to whether bees may prefer one color above another is not a point of any particular importance; but it may be interesting to know, nevertheless.

"THE STINGER," under "Stray Stings," in the *American Bee Journal*, charges GLEANINGS with being somewhat of an imitator. He says that the *Bee Journal* started the picture business in the biographical work, and that GLEANINGS ought to have waited till our esteemed cotemporary had "exhausted the field." Evidently, The Stinger is a new hand in the field or else he is not acquainted with the back numbers of GLEANINGS. Several years ago, biographical work with engravings was a very common feature of our journal. In fact, a goodly number of pictures of bee-men which have appeared in the *Journal* were printed on plates from this office, all of which our esteemed friend Editor York has generously acknowledged. Say, Stinger, didn't you pretty nearly copy after Stray Straws in your heading? The style is much the same, the first part of the name is the same—well, well—"we do not intend to sting hard over this little matter;" and if our friend Stinger is present at the big convention in Chicago we hope we shall have the pleasure of getting a good grip of his hand.

AMONG all the interesting pictures we have put in GLEANINGS, we do not think we ever inserted one that is more so than the group showing the Atchley family—the most extensive queen-breeders in the world. In 1893 they raised (or will have done) 5000 queens; in comparison with which no wonder Bro. Hutchinson said in the *Review* that no one in the North, has any business rearing queens. The Southern breeders have every advantage in the world over those of the North. We clip the following from the Houston, Texas, *Post*, of Sept. 18:

Mrs. Jennie Atchley, the noted bee-breeder of the South, has moved her outfit to Beeville, and will in future make this her headquarters. Their apiary in all consists of about 500 stands, mostly of improved stock. She was heard to remark yesterday, while unloading, that she had some queens worth at least \$100. To one not up in "beeology," this seems very extraordinary for a single bee, and we so remarked; but the lady replied that she had one queen from which she had realized \$1000 this year. Mrs. Atchley seems perfectly at home among her "pets," as she calls them, and realizes a handsome income each year. Her family consists of ten, all of whom are welcomed to Beeville's society. What has been Greenville's loss by their removal from that city has been Beeville's gain.

HINT TO EXTRACTED-HONEY MEN; QUIET ROB-BING, AND HOW IT MAY BE OF SERVICE IN CLEANING OUT COMBS JUST EXTRACTED.

SOME nine years ago our neighbor Burt discovered accidentally that quiet robbing, such as we described in our issue for Sept. 1, was all that we claimed for it in that number. Verily there is nothing new under the sun. He discovered it in this way: After one extracting he had placed a lot of combs, just extracted, tiered up in the honey-house. The top of the tier was carefully covered, and, as he supposed, every thing was secured from robbers. Very shortly after, he noticed the bees were going under the building. Suspecting that they were at these combs, he pulled open the hives, and, to his horror, found them full of robber bees. On examination he discovered that there was a small knot-hole in the floor, just under the hive. Through this the bees had been making their way, one or two at a time. On the principle that it is best to let robbers clean things out when they once get started, he closed up the hives and let the bees have their own sweet will. Quite to his astonishment there was no uproar in the apiary, and the combs were cleaned out beautifully. The plan

worked so well that he stored other combs, just extracted, over the knot-hole, and these were cleaned out in the same way. As this was after the honey season, brood-rearing was stimulated, extracting-combs were cleared, and every thing was done quietly, decently, and in order. It is almost needless to say that he lets the bees clean all his extra combs, just extracted, in that very way, up to the present day.

We give this point as we think it will be seasonable and valuable to many who have not yet extracted their combs, because there will be warm days in Indian summer when the extracting can be done very easily.

THE *American Bee Journal* for Sept. 28 is just at hand; and in relation to the big convention to be held in Chicago, we find that the following are some of the subjects that will be discussed:

Production of comb honey; winter losses; the Bee-keepers' Union; prevention of swarming; grading honey; apiculture at experiment stations.

Also that the following named persons have signified their intention of being present, nearly all of whom are bee-keepers of world-wide reputation:

Frank Benton and family; O. R. Coe; H. D. Cutting; A. N. Draper; J. A. Green; J. M. Hambaugh; R. F. Holtermann; W. Z. Hutchinson; W. G. Larrabee; Dr. A. B. Mason; Dr. C. C. Miller; Thos. G. Newman; A. I. Root; C. F. Muth; Barnett Taylor; Mrs. J. N. Heater; L. C. Axtell; W. S. Pouder; O. L. Her-shiser; F. W. Jones; R. B. Leahy; M. H. Mandelbaum; Dr. P. J. Parker; J. A. Stone; C. C. Clemons; G. E. Hilton; G. R. Pierce; C. H. Thies; H. C. Mellon; C. Theilmann; T. Ober-litner; F. A. Gemmill; G. B. Brown; S. T. Pettit.

FLORIDA. For sale, 75 hives of bees; inquire of AUG. LEYVRAZ, Francis, Fla. 19tf

Wants or Exchange Department.

Notices will be inserted under this head at one-half our usual rates. All advertisements intended for this department must not exceed five lines, and you must say you want your ad't in this department, or we will not be responsible for errors. You can have the notice as many lines as you please, but all over five lines will cost you according to our regular rates. This department is intended only for bona-fide exchanges. Exchanges for cash or for price lists, or notices offering articles for sale, can not be inserted under this head. For such our regular rates of 20 cts. a line will be charged, and they will be put with the regular advertisements. We can not be responsible for dissatisfaction arising from these "swaps."

WANTED.—To exchange 13 swarms of bees, 12 empty hives, 48 crates filled with sections, starters, and separators, 800 brood-frames, 60 wide-frames in Simplicity hives, for poultry, pigeons, or live stock.

W. H. R. UMSTEAD,

316 North Center St., Bethlehem, Pa.

TO TRADE.—For honey—ext'd or comb—3 safety bicycles, one 30-inch and 2 28-inch wheels, 1½-inch cushion tires—2 brand new, one used some.

Address

JNO. A. THORNTON, Lima, Ill.

WANTED.—To exchange pneumatic-tired safety bicycle, for pure comb honey, or sporting goods, electric dynamos, etc.

ROBT. B. GEDYE, 668 Todd St., La Salle, Ill.

We received the sewing-machine, and it works all right. This makes the second one we sent for, and they both sewed as nice as any of the other machines.

W. A. FLORA.

Eaton, O., Sept. 2.

To Get Acquainted,

We will send the *Bee-keepers' Enterprise* from now until Jan., '95 (16 months), for 50 c.; or 3 months for 15 cts. You will be pleased with your investment, in either case.

Burton L. Sage,

New Haven, - - - Conn.

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Warranted Golden Queens,

80c; 6 for \$4.25; dozen, \$8.00; young tested, \$1.00 up. Write for prices on select and breeders.

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Thirty colonies in No. 1 shape, mostly in new L. hives. The lot for \$100.00, or \$3.50 each in small lots. Pure Italian, \$5.00.

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Try my fine Italian queens. Either 3 or 5 banded, bred in different yards, 75 cts. each; \$4.25 for 6, or \$8.00 per doz. Prices to dealers, and by the quantity, on application. Fine breeders, \$5.00; always on hand. Prices for those that produce strictly 5-banded bees, on application. Remember, I guarantee safe arrival, and satisfaction in the bounds of reason.

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GREGORY BROS. & SON,

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Read what J. I. PARENT, of CHARLTON, N. Y., says—"We cut with one of our Combined Machines last winter 50 chaff hives with 7-inch cap, 100 honey-racks, 500 broad frames, 2,000 honey-boxes, and a great deal of other work. This winter we have doubled the amount of bee-hives, etc., to make, and we expect to do it all with this saw. It will do all you say it will."

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23tf

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